



# **Production of I.V. Fluids (Saline and Dextrose).**

## **Intravenous Solution (IV) Manufacturing Business with Blow-Fill-Seal (BFS) Technology.**



Extrusion

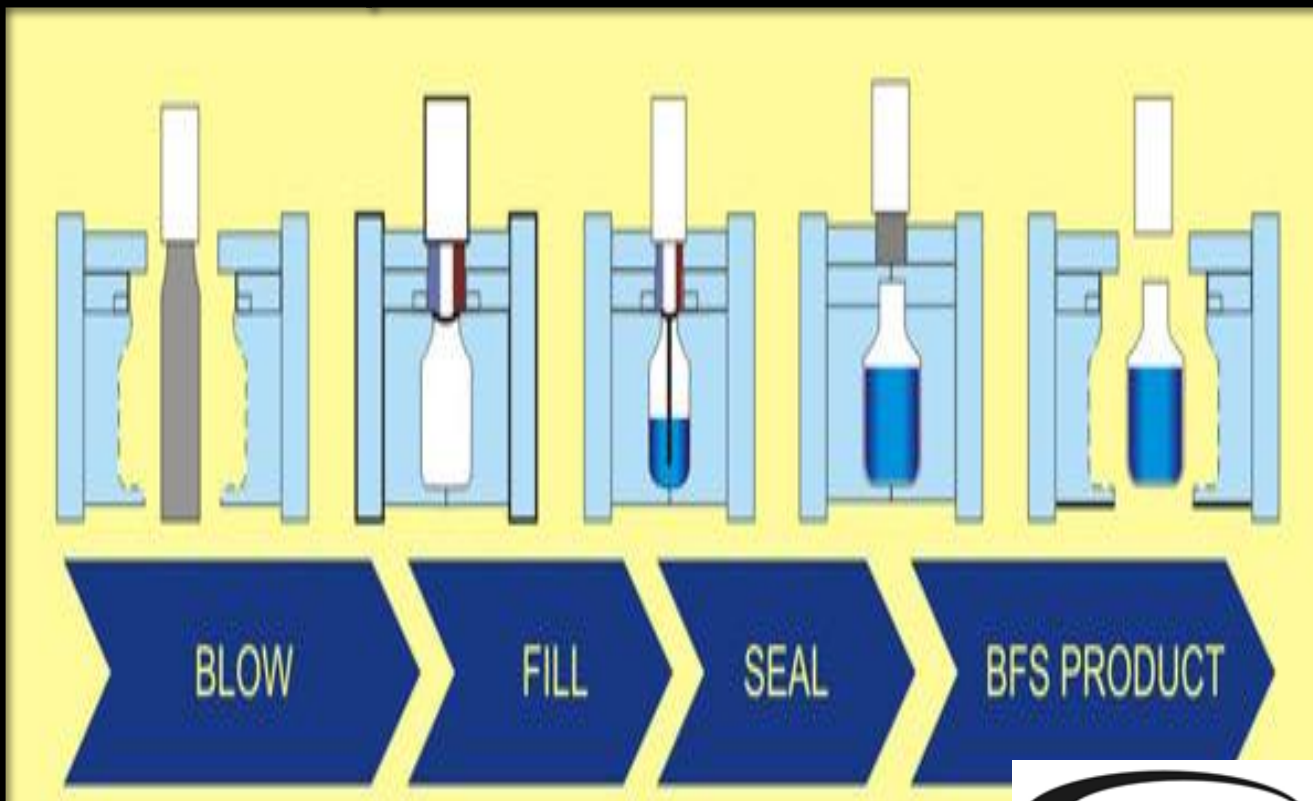
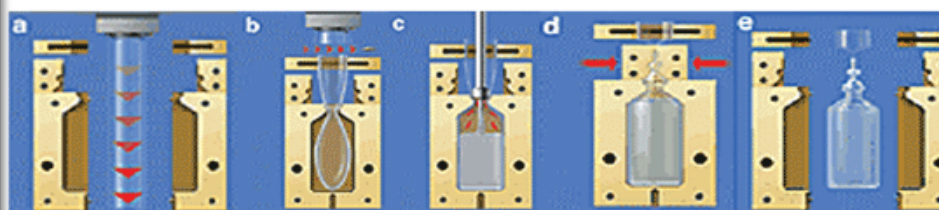
Blow

Fill

Seal

De-fl

Figure 3: Container Moulding, Filling and Sealing



BLOW

FILL

SEAL

BFS PRODUCT



# **Introduction**

**Fluids are given when someone's body fluid volume falls. There are a number of things which can cause a drop in fluid volume. Vomiting and diarrhea are a classic example, which is why people are encouraged to drink fluids when they are sick, to keep their fluid volume stable. Another cause is blood loss, which causes problems both because people lose blood products, and because they experience a loss in fluid volume. Electrolyte levels in the blood can also become unstable as a result of rapid changes in fluid volume, in which case intravenous fluids can be used to restore the balance.**

**Intravenous fluids are fluids which are intended to be administered to a patient intravenously, directly through the circulatory system. These fluids must be sterile to protect patients from injury, and there are a number of different types available for use. Many companies manufacture packaged intravenous fluids, as well as products which can be mixed with sterile water to prepare a solution for intravenous administration.**





**Intravenous fluids can be broken into two broad groups. Crystalloids such as saline solutions contain a solution of molecules which can dissolve in water. When crystalloids are administered, they tend to create low osmotic pressure, allowing fluid to move across the blood vessels, and this can be linked with edema. Colloids contain particles which are not soluble in water, and they create high osmotic pressure, attracting fluid into the blood vessels. Blood is an example of a commonly administered intravenous colloid.**

**Infusion therapy as a basic toll of modern medical care enables the physician to restore and stabilize homeostasis states quickly and completely.**

**In nursing homes and hospital where patients are suffering from acute dehydration or considerable debilitating conditions, the intra venous fluids are used as I.V. drips. The basic function of I.V. fluids is to replenish the body fluids. Although there are a number of I.V. fluids but generally three types of I.V. fluids are used in hospitals as I.V. drips.**



## ***Uses and Applications***

**There are main ranges of application of highly specialized intravenous infusion solutions:**

- **Treatment of discarded water and electrolyte metabolism, especially in severe cases.**
- **Therapy of acid base imbalances.**
- **The volume substitution and volume replacement in surgery of accident victim suffering blood loss.**
- **Parenteral nutrition for severely ill and post-operative patients.**

- **Aqueous isotonic injection (5%) of dextrose is given as intravenous injections to increase the column of circulating blood in the shocks and haemorrhages and to counteract dehydration. When it is desired to replace excessive salt loss also glucose is injected along with sodium chloride.**

**Intravenous fluids can also be used as a route of medication administration. If a doctor wants to deliver a small amount of medication over an extended period of time, it can be dissolved in a bag of intravenous fluids and set on an infusion pump which delivers the medicated fluid directly into the blood.**



**They are also commonly used to assist with surgical recovery; people who receive fluids after surgery tend to experience better recovery than people who do not.**

**Intravenous Fluids Market is expected to witness growth of international market with respect to advancements and innovations including development history, competitive analysis and regional development forecast.**



## ***Demand & Market Growth Rates of I.V. Fluid Sets in India***

### **Demand : Past and Future**

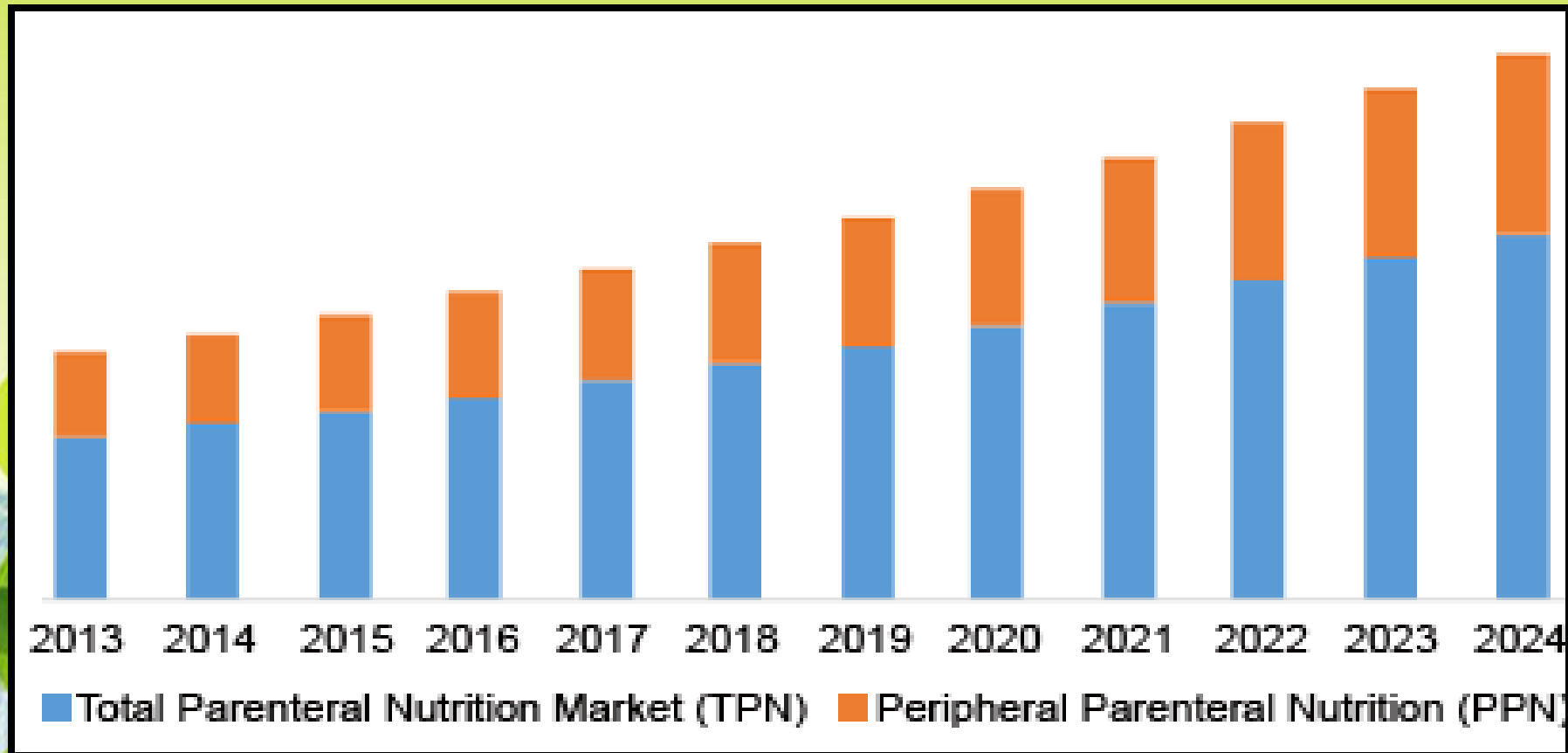
<b>Year</b>	<b>(In Million bottles)</b>
<b>1990-91</b>	165
<b>2000-01</b>	565
<b>2001-02</b>	633
<b>2002-03</b>	712
<b>2003-04</b>	799
<b>2004-05</b>	865
<b>2005-06</b>	975
<b>2006-07</b>	1100
<b>2007-08</b>	1238
<b>2008-09</b>	1378
<b>2009-10</b>	1545
<b>2010-11</b>	1725
<b>2011-12</b>	1940
<b>2012-13</b>	2150
<b>2013-14</b>	2365
<b>2014-15</b>	2630
<b>2015-16</b>	2885
<b>2016-17</b>	3210
<b>2017-18</b>	3570
<b>2018-19</b>	3945
<b>2019-20</b>	4375
<b>2024-25</b>	7200

**The growth of the global intravenous solutions market is driven by several factors. The increasing incidence of gastrointestinal disorders, diabetes, and cancer is one of the major factors that are expected to increase the rate of adoption of intravenous solutions among consumers. The rising popularity of intravenous vitamin C therapy in cancer treatment is one of the major trends in the intravenous solutions market. The intravenous vitamin C solution has been observed to have an increased toxicity to cancer cells and improve the patients' quality of life.**

**Intravenous fluids are extensively used to treat electrolyte imbalances, maintain fluid balance, and replace fluid losses. These fluids are dispensed in volumes ranging from 25-1,000 milliliters and are available in either plastic bags or glass bottles. A complete mixture of all essential nutrients is also available in multi-chamber bags, and these bags are gaining immense popularity among numerous end-users.**

**The global Intravenous (I.V.) solutions market was valued at USD 6.9 billion in 2015 and is projected to grow at a CAGR of 7.8% over the forecast period. The emergence of this market is attributed to the fast growing geriatric population and prevalence of malnutrition in the elderly and pediatric population.**

## *North American Intravenous Solutions Market, By Type*





## ***Blow-Fill-Seal (BFS) Technology***

**In blow-fill-seal (BFS) technology, which is a form of advanced aseptic manufacturing, the container is formed, filled, and sealed in one continuous, automated system. A primary advantage of this technology is reducing human intervention, which reduces the risk of microbial contamination and foreign particulates. BFS has long been used in liquid pharmaceutical applications, including small containers, such as ophthalmic and respiratory drug ampoules, as well as larger volume containers, such as saline or dextrose solutions. More recently, BFS technology has been expanding into injectable and into biologics, including vaccines and monoclonal antibodies (mAbs).**

## ***Advantages of BFS Technology:***

- **Blow-fill-seal technology enables the manufacture of preservative-free single-unit doses. Preservative-free single-unit doses are recognized as potentially harmful to the sensitive mucosae of the eyes, nose, and lungs, so this is an enormous benefit to sensitive patients.**
- **Another advantage of unit-doses is that they ensure that the patient takes the correct amount of product, especially when dealing with highly potent compounds, i.e. those therapeutically active at a low concentration.**

- **Sterile unit-doses are portable and easy to use individually, excellent properties for today's active lifestyles. Blow-fill-seal (BFS) single doses are an ideal solution for use in ophthalmology, respiratory diseases, rhinology, antisepsis and wound care.**
- **Blow-fill-seal technology reduces personnel intervention making it a more robust method for the aseptic preparation of sterile pharmaceuticals. BFS is used for the filling of vials for parenteral preparations and infusions, eye drops, and inhalation products. Generally the plastic containers are made up of polyethylene and polypropylene. Polypropylene is more commonly used to form containers which are further sterilised by autoclaving as polypropylene has greater thermostability.**

- **Blow Fill and Seal technology is mainly used for pharmaceutical solutions. The examples of pharmaceutical solutions that can be packaged are injectable solutions, antibiotics, ophthalmological drops, suspensions, infusion solutions, solutions for dialysis, solutions for irrigation and solutions for hemofiltration.**

**The basic concept of BFS is that a container is formed, filled, and sealed in a continuous process without human intervention, in a sterile enclosed area inside a machine. Thus this technology can be used to aseptically manufacture sterile pharmaceutical liquid dosage forms.**

**The process is multi-stepped: first, pharmaceutical-grade plastic resin is vertically heat extruded through a circular throat to form a hanging tube called the parison. This extruded tube is then enclosed within a two-part mould, and the tube is cut above the mould. The mould is transferred to the filling zone, or sterile filling space, where filling needles (mandrels) are lowered and used to inflate the plastic to form the container within the mould. Following the formation of the container, the mandrel is used to fill the container with liquid. Following filling the mandrels are retracted and a secondary top mould seals the container. All actions take place inside a sterile shrouded chamber inside the machine. The product is then discharged to a non-sterile area for labeling, packaging and distribution.**



**The process begins with the Extrusion of plastic granules in the form of a hot hollow pipe of molten plastic called a parison.**

**The following step is the Blow moulding of the container from the plastic granule. The parison is closed between the mould, and the container gets formed either by blowing sterile compressed air or by vacuum or by using vacuum as well as blowing. The container assumes the shape of the cavity in the mould. The container thus produced is open from the top and in its top part, the plastic is still hot and in molten state until the subsequent steps of filling and container sealing.**

**The subsequent step is filling of the formed container from the top, which is still open (and still in a “hot molten” state). Filling nozzles enter from the top of container and filling is done. Filling nozzles are specially designed and constructed to facilitate automatic cleaning and automatic sterilization. Additional functions of filling nozzles are to blow the bottles and also to provide an exhaust path for air in the container. The filling process can be carried out under a shower of sterile filtered air to avoid contamination during filling. The blower on the sterile air shower can have variable pressure which can be made to change automatically so as to maintain constant air pressure under various situations. The sterile air shower is validated at certain air pressure, and an automatic device can maintain the same pressure by automatically modulating the speed of the blower.**

**The next step is sealing the top of the container, which is still open and in a hot molten state. The top gets pressed between head moulds and as a consequence, the top part of the container gets formed, sealed and at the same time, gets cooled. The result is a hermetically sealed container.**

**The final steps are for De-flashing to remove the flash or scrap, trimming the containers and delivering the containers outside the machine. The whole process of extrusion, blowing, filling, sealing and removing scrap takes between 10 to 18 seconds depending upon the type and size of the container. The advantage of the Blow-Fill-Seal process is derived mainly from the fact that container is formed, quickly filled and sealed under protected environment automatically without human intervention.**

## ***BFS Machine***

**Professional normal saline I.V. fluids packaging machine is the latest production line with most advanced technology. It can automatically finish film feeding, printing, bag making, filling and sealing in one machine.**

**This BFS line can be used to automatically fill 50-5000ml general solution, special solution, dialysis solution, parenteral nutrition, Antibiotics, Irrigation and Disinfectant solution etc.**



## ***Features:***

- 1. 100% film utilization: No waste edge between bags, reducing both material and energy consumption.**
- 2. Special I.V. bag design: each bag saves 10mm film than others.**
- 3. Reliable heating and welding system: Leakage rate less than 0.03%.**
- 4. Quick changeover: 0.5-1 hour to switch from one size to another.**
- 5. Stable transmission system: only needs 1 control system, 1 HMI and 1 operator.**



- 6. Safe filling nozzle: No solution overflows, no particles generation.**
- 7. Auto faulty rejection system detected by the machine.**
- 8. Production line length is reduced by 1/3, both workshop and air conditioning and cleaning area are reduced by 1/3, greatly reducing the initial investment and future running cost.**
- 9. Simple structure, more stable and reliable performance.**

# Machinery Photographs



**Injection-Stretch-Blow-Moulding  
Machine**



**PP Bottle Washing-Filling-Sealing  
Machine**



**Bottle Feeding Station**



**Bottle Washing Station**



# Project at a Glance

## PROJECT AT A GLANCE

(` in lacs)

COST OF PROJECT				MEANS OF FINANCE			
Particulars	Existing	Proposed	Total	Particulars	Existing	Proposed	Total
Land & Site Development Exp.	0.00	129.00	129.00	Capital	0.00	208.43	208.43
Buildings	0.00	270.80	270.80	Share Premium	0.00	0.00	0.00
				Other Type Share			
Plant & Machineries	0.00	252.63	252.63	Capital	0.00	0.00	0.00
Motor Vehicles	0.00	10.00	10.00	Reserves & Surplus	0.00	0.00	0.00
Office Automation Equipments	0.00	62.00	62.00	Cash Subsidy	0.00	0.00	0.00
Technical Knowhow Fees & Exp.	0.00	25.00	25.00	Internal Cash Accruals	0.00	0.00	0.00
Franchise & Other Deposits	0.00	0.00	0.00	Long/Medium Term Borrowings	0.00	625.29	625.29
Preliminary & Pre-operative Exp	0.00	3.00	3.00	Debentures / Bonds	0.00	0.00	0.00
Provision for Contingencies	0.00	25.00	25.00	Unsecured Loans/Deposits	0.00	0.00	0.00
Margin Money - Working Capital	0.00	56.30	56.30				
<b>TOTAL</b>	<b>0.00</b>	<b>833.72</b>	<b>833.72</b>	<b>TOTAL</b>	<b>0.00</b>	<b>833.72</b>	<b>833.72</b>

# Project at a Glance

Year	Annualised		Book Value	Debt	Divide nd	Retained Earnings		Payou t	Probab le Market Price	P/E Ratio	Yield Price/ Book Value
	EPS	CEPS	Per Share		Per Share	Per Share		%		No.of Times	%
1-2	6.07	9.82	16.07	24.00	0.00	100.00	6.07	0.00	6.07	1.00	0.00
2-3	9.07	12.35	25.14	18.00	0.00	100.00	9.07	0.00	9.07	1.00	0.00
3-4	12.00	14.89	37.14	12.00	0.00	100.00	12.00	0.00	12.00	1.00	0.00
4-5	14.83	17.37	51.97	6.00	0.00	100.00	14.83	0.00	14.83	1.00	0.00
5-6	17.55	19.78	69.52	0.00	0.00	100.00	17.55	0.00	17.55	1.00	0.00

# Project at a Glance

Year	D. S. C. R.			Debt / Equity - 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	1.41	1.41		1.49	1.49	2.05		20.57%	12.19%	8.37%	793.46	52.48%	1.51	1.04
2-3	1.74	1.57		0.72	0.72	1.13		23.14%	16.40%	10.71%	873.94	49.54%	1.61	1.42
3-4	2.13	1.74	2.12	0.32	0.32	0.64		24.85%	19.37%	12.41%	997.56	49.48%	1.61	1.89
4-5	2.59	1.92		0.12	0.12	0.37		26.00%	21.46%	13.63%	1121.18	49.43%	1.55	2.42
5-6	3.14	2.12		0.00	0.00	0.21		26.74%	22.94%	14.51%	1244.79	49.40%	1.45	4.22



# Project at a Glance

## BEP

BEP - Maximum Utilisation Year	5
Cash BEP (% of Installed Capacity)	49.13%
Total BEP (% of Installed Capacity)	52.87%
IRR, PAYBACK and FACR	
Internal Rate of Return .. ( In %age )	29.14%
Payback Period of the Project is ( In Years )	2 Years 3 Months
Fixed Assets Coverage Ratio ( No. of times )	5.242

# Major Queries/Questions Answered in the Report?

- 1. What is I.V. Fluids (BFS Technology) Manufacturing industry ?**
- 2. How has the I.V. Fluids (BFS Technology) Manufacturing industry performed so far and how will it perform in the coming years ?**
- 3. What is the Project Feasibility of I.V. Fluids (BFS Technology) Manufacturing Plant ?**
- 4. What are the requirements of Working Capital for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**

- 5. What is the structure of the I.V. Fluids (BFS Technology) Manufacturing Business and who are the key/major players ?**
- 6. What is the total project cost for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**
- 7. What are the operating costs for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**
- 8. What are the machinery and equipment requirements for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**

**9. Who are the Suppliers and Manufacturers of Plant & Machinery for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**

**10. What are the requirements of raw material for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**

**11. Who are the Suppliers and Manufacturers of Raw materials for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**

**12. What is the Manufacturing Process of I.V. Fluids (BFS Technology) ?**

- 13. What is the total size of land required for setting up I.V. Fluids (BFS Technology) Manufacturing plant ?**
- 14. What will be the income and expenditures for I.V. Fluids (BFS Technology) Manufacturing Business?**
- 15. What are the Projected Balance Sheets of I.V. Fluids (BFS Technology) Manufacturing plant ?**
- 16. What are the requirement of utilities and overheads for setting up I.V. Fluids (BFS Technology) Manufacturing plant?**
- 17. What is the Built up Area Requirement and cost for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**

**18. What are the Personnel (Manpower) Requirements for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**

**19. What are Statistics of Import & Export for I.V. Fluids (BFS Technology)?**

**20. What is the time required to break-even of I.V. Fluids (BFS Technology) Manufacturing Business?**

**21. What is the Break-Even Analysis of I.V. Fluids (BFS Technology) Manufacturing plant?**

**22. What are the Project financials of I.V. Fluids (BFS Technology) Manufacturing Business?**



- 23. What are the Profitability Ratios of I.V. Fluids (BFS Technology) Manufacturing Project?**
- 24. What is the Sensitivity Analysis-Price/Volume of I.V. Fluids (BFS Technology) Manufacturing plant?**
- 25. What are the Projected Pay-Back Period and IRR of I.V. Fluids (BFS Technology) Manufacturing plant?**
- 26. What is the Process Flow Sheet Diagram of I.V. Fluids (BFS Technology) Manufacturing project?**

- 27. What are the Market Opportunities for setting up I.V. Fluids (BFS Technology) Manufacturing plant?**
- 28. What is the Market Study and Assessment for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**
- 29. What is the Plant Layout for setting up I.V. Fluids (BFS Technology) Manufacturing Business?**

# Table of Contents of the Project Report

## 1. PROJECT LOCATION

## 2. INTRODUCTION

## 3. USES AND APPLICATIONS

## 4. PROPERTIES

## 5. TYPES OF FLUID

## 6. MARKET SURVEY

## 7. FINANCIALS & COMPARISON OF MAJOR INDIAN PLAYERS/COMPANIES

7.1. ABOUT FINANCIAL STATEMENTS OF CMIE DATABASE

7.2. PROFITS & APPROPRIATIONS

7.3. TOTAL LIABILITIES

7.4. TOTAL ASSETS

7.5. NET CASH FLOW FROM OPERATING ACTIVITIES

7.6. SECTION – I

7.6.1. Name of Company with Contact Details

- 7.6.2. Name of Director (s)
- 7.6.3. Plant Capacity
- 7.6.4. Location of Plant
- 7.6.5. Name of Raw Material (s) Consumed With Quantity & Cost
- 7.7. SECTION – II
- 7.7.1. Assets
- 7.7.2. Cash Flow
- 7.7.3. Cost as % Ge of Sales
- 7.7.4. Forex Transaction
- 7.7.5. Growth in Assets & Liabilities
- 7.7.6. Growth in Income & Expenditure
- 7.7.7. Income & Expenditure
- 7.7.8. Liabilities
- 7.7.9. Liquidity Ratios
- 7.7.10. Profitability Ratio
- 7.7.11. Profits
- 7.7.12. Return Ratios
- 7.7.13. Structure of Assets & Liabilities (%)
- 7.7.14. Working Capital & Turnover Ratios

## **8. GRADES OF I.V. FLUID**

- 9. INTRAVENOUS FLUID COMPARISON**
- 10. PRODUCT DESCRIPTION**
- 11. RAW MATERIAL**
- 12. REQUIREMENTS OF RAW MATERIALS**
- 13. SOME GENERAL INTRAVENOUS FLUIDS**
- 14. MANUFACTURING PROCESS**
- 15. BLOW-FILL-SEAL (BFS) TECHNOLOGY**
- 16. QUALITY CONTROL**
- 17. PROCESS FLOW DIAGRAM**
- 18. BUYER'S LIST**



## **19. SUPPLIERS OF PLANT AND MACHINERY**

## **20. SUPPLIERS OF RAW MATERIAL**

## **21. PHOTOGRAPHS/IMAGE FOR REFERENCE**

- 21.1. PRODUCT PHOTOGRAPHS
- 21.2. MACHINERY PHOTOGRAPHS
- 21.3. RAW MATERIAL PHOTOGRAPHS

## **22. PLANT LAYOUT**

## **23. QUOTATION OF PLANT, MACHINERY AND EQUIPMENTS FROM SUPPLIERS**

# Project Financials

<b>Project at a Glance</b>	<b>Annexure</b>
• Assumptions for Profitability workings .....	1
• Plant Economics.....	2
• Production Schedule.....	3
• Land & Building.....	4
Factory Land & Building	
Site Development Expenses	

- **Plant & Machinery.....5**
  - Indigenous Machineries**
  - Other Machineries (Miscellaneous, Laboratory etc.)**
- **Other Fixed Assets.....6**
  - Furniture & Fixtures**
  - Pre-operative and Preliminary Expenses**
  - Technical Knowhow**
  - Provision of Contingencies**
- **Working Capital Requirement Per Month.....7**
  - Raw Material**
  - Packing Material**
  - Lab & ETP Chemical Cost**
  - Consumable Store**

- **Overheads Required Per Month and Per Annum.....8**  
**Utilities & Overheads (Power, Water and Fuel Expenses etc.)**  
**Royalty and Other Charges**  
**Selling and Distribution Expenses**
  
- **Salary and Wages .....9**
  
- **Turnover Per Annum .....10**
  
- **Share Capital.....11**  
**Equity Capital**  
**Preference Share Capital**

- **Annexure 1 :: Cost of Project and Means of Finance**
- **Annexure 2 :: Profitability and Net Cash Accruals**
  - **Revenue/Income/Realisation**
  - **Expenses/Cost of Products/Services/Items**
  - **Gross Profit**
  - **Financial Charges**
  - **Total Cost of Sales**
  - **Net Profit After Taxes**
  - **Net Cash Accruals**

• **Annexure 3 :: Assessment of Working Capital requirements**

- **Current Assets**
- **Gross Working Capital**
- **Current Liabilities**
- **Net Working Capital**
- **Working Note for Calculation of Work-in-process**

• **Annexure 4 :: Sources and Disposition of Funds**



- **Annexure 5 :: Projected Balance Sheets**

- **ROI (Average of Fixed Assets)**
- **RONW (Average of Share Capital)**
- **ROI (Average of Total Assets)**

- **Annexure 6 :: Profitability Ratios**

- **D.S.C.R**
- **Earnings Per Share (EPS)**
- **Debt Equity Ratio**

• **Annexure 7 :: Break-Even Analysis**

- **Variable Cost & Expenses**
- **Semi-Variable/Semi-Fixed Expenses**
- **Profit Volume Ratio (PVR)**
- **Fixed Expenses / Cost**
- **B.E.P**

• **Annexure 8 to 11 :: Sensitivity Analysis-Price/Volume**

- **Resultant N.P.B.T**
- **Resultant D.S.C.R**
- **Resultant PV Ratio**
- **Resultant DER**
- **Resultant ROI**
- **Resultant BEP**

- **Annexure 12 :: Shareholding Pattern and Stake Status**

- **Equity Capital**
- **Preference Share Capital**

- **Annexure 13 :: Quantitative Details-Output/Sales/Stocks**

- **Determined Capacity P.A of Products/Services**
- **Achievable Efficiency/Yield % of Products/Services/Items**
- **Net Usable Load/Capacity of Products/Services/Items**
- **Expected Sales/ Revenue/ Income of Products/ Services/ Items**

- **Annexure 14** :: **Product wise Domestic Sales Realisation**
- **Annexure 15** :: **Total Raw Material Cost**
- **Annexure 16** :: **Raw Material Cost per unit**
- **Annexure 17** :: **Total Lab & ETP Chemical Cost**
- **Annexure 18** :: **Consumables, Store etc.**
- **Annexure 19** :: **Packing Material Cost**
- **Annexure 20** :: **Packing Material Cost Per Unit**

- **Annexure 21** :: **Employees Expenses**
- **Annexure 22** :: **Fuel Expenses**
- **Annexure 23** :: **Power/Electricity Expenses**
- **Annexure 24** :: **Royalty & Other Charges**
- **Annexure 25** :: **Repairs & Maintenance Expenses**
- **Annexure 26** :: **Other Manufacturing Expenses**
- **Annexure 27** :: **Administration Expenses**
- **Annexure 28** :: **Selling Expenses**



- **Annexure 29 :: Depreciation Charges – as per Books (Total)**
- **Annexure 30 :: Depreciation Charges – as per Books (P & M)**
- **Annexure 31 :: Depreciation Charges - as per IT Act WDV (Total)**
- **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**

# Reasons for Buying our Report:

- **This report helps you to identify a profitable project for investing or diversifying into by throwing light to crucial areas like industry size, market potential of the product and reasons for investing in the product**
- **This report provides vital information on the product like it's characteristics and segmentation**
- **This report helps you market and place the product correctly by identifying the target customer group of the product**

- **This report helps you understand the viability of the project by disclosing details like machinery required, project costs and snapshot of other project financials**
- **The report provides a glimpse of government regulations applicable on the industry**
- **The report provides forecasts of key parameters which helps to anticipate the industry performance and make sound business decisions**

# Our Approach:

- **Our research reports broadly cover Indian markets, present analysis, outlook and forecast for a period of five years.**
- **The market forecasts are developed on the basis of secondary research and are cross-validated through interactions with the industry players**
- **We use reliable sources of information and databases. And information from such sources is processed by us and included in the report**

## **Scope of the Report**

The report titled “Market Survey cum Detailed Techno Economic Feasibility Report on I.V. Fluids (BFS Technology) ” provides an insight into I.V. Fluids (BFS Technology) market in India with focus on uses and applications, Manufacturing Process, Process Flow Sheets, Plant Layout and Project Financials of I.V. Fluids (BFS Technology) project. The report assesses the market sizing and growth of the Indian I.V. Fluids (BFS Technology) 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 I.V. Fluids (BFS Technology) sector in India along with its business prospects. Through this report we have identified I.V. Fluids (BFS Technology) project as a lucrative investment avenue.**



# Tags

I.V. Fluid Manufacturing Industry, I.V. Fluids Manufacturing Project Report, I.V. Fluids Manufacturing Process, Project Report for I.V. Fluid Plant, I.V. Fluids Manufacturing Equipment, IV Fluids Manufacturing Project Report, I.V. Fluid Manufacturing Plant in India, I.V. Fluids Manufacture, I.V. Fluid Production Plant, I.V. Fluid and Dialysis Solution Manufacturing, Project Report on Dextrose Saline (IV Fluid) Production, I.V. Fluids Production, I.V. Fluid Manufacturing Unit, IV Fluid Manufacturing Business, Pharma Manufacturing Unit in India, Pharmaceutical Company, Intravenous Fluid Production, Project Report on I.V. Fluid, IV Fluid Manufacturing Unit in India, I.V. Fluids Manufacturing Process, I.V. Fluids Manufacturing Equipment, Manufacturing Plant for I.V. Fluid, I.V. Fluid Manufacturing Machine, I.V. Fluids Manufacturing Project Report, IV Fluid Manufacturing Business, Manufacturing Plan of Intravenous Fluid, How to Start I.V. Fluid Production Business, I.V. Solution Manufacturing with BFS Technology, Blow-Fill-Seal Technology, Saline and Dextrose Fluid (IV Fluid) BFS Technology, Blow Fill Seal(BFS) Technology, Project Report on I.V. Fluid (BFS Technology), I.V. Fluid with BFS, Blow-Fill-Seal Machinery, I.V. Fluid Manufacturing using Blow-Fill-Seal Technology, I.V. Fluid Manufacturing project ideas,

Projects on Small Scale Industries, Small scale industries projects ideas, IV Fluid Manufacturing Based Small Scale Industries Projects, Project profile on small scale industries, How to Start I.V. Fluid Manufacturing Industry in India, I.V. Fluid Manufacturing Projects, New project profile on I.V. Fluid Manufacturing industries, Project Report on IV Fluid Manufacturing Industry, Detailed Project Report on IV Fluid Manufacturing, Production of Intravenous Sugar Solution (Dextrose Solution), Saline and Dextrose Fluid (iv Fluid) BFS Technology, Production of Intravenous Sugar Solution, Project Report on I.V. Fluid Manufacturing, Pre-Investment Feasibility Study on IV Solution Manufacturing with BFS Technology, Techno-Economic feasibility study on I.V. Solution Manufacturing with BFS Technology, Feasibility report on I.V. Solution Manufacturing with BFS Technology, Free Project Profile on I.V. Solution Manufacturing with BFS Technology, Project profile on I.V. Solution Manufacturing with BFS Technology, Download free project profile on IV Solution Manufacturing with BFS Technology, Industrial Project Report, Project consultant, Project consultancy, Business guidance to clients, Startup Project for I.V. Solution Manufacturing with BFS Technology, Production of I.V. Fluids (Saline and Dextrose). Intravenous Solution (IV) Manufacturing Business with Blow-Fill-Seal (BFS) Technology

**Niir Project Consultancy Services (NPCS)  
can provide Detailed Project Report on  
Production of I.V. Fluids (Saline and  
Dextrose).**

**Intravenous Solution (IV) Manufacturing  
Business with Blow-Fill-Seal (BFS)  
Technology.**

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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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**The detailed project report covers all aspect of business, from analyzing the market, confirming availability of various necessities such as Manufacturing Plant, Detailed Project Report, Profile, Business Plan, Industry Trends, Market Research, Survey, Manufacturing Process, Machinery, Raw Materials, Feasibility Study, Investment Opportunities, Cost and Revenue, Plant Economics, Production Schedule,**

**Working Capital Requirement, uses and applications, Plant Layout, Project Financials, Process Flow Sheet, Cost of Project, Projected Balance Sheets, Profitability Ratios, Break Even Analysis. The DPR (Detailed Project Report) is formulated by highly accomplished and experienced consultants and the market research and analysis are supported by a panel of experts and digitalized data bank.**

**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 India along with its business prospects.....[Read more](#)**



# Contact us

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# Niir PROJECT CONSULTANCY SERVICES

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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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