

# Manufacture of Thinners & Solvents (Properties, Uses, Production, Formulation with Machinery Details) 2nd Edition

**Author:-** NPCS Board of Consultants & Engineers

**Format:** paperback

**Code:** NI306

**Pages:** 296

**Price: Rs.1875US\$ 150**

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Solvents are defined as chemicals compound that are introduced during manufacture of the paint itself and before packaging, in order to maintain all components of the paint in a liquid / viscous state such as we know it. A solvent is usually a liquid but can also be a solid or a gas. Solvents find various applications in chemical, pharmaceutical, oil, and gas industries, including in chemical syntheses and purification processes.

Thinners are defined as chemical compounds that are introduced into the paint prior to application, in order to modify the viscosity and other properties related to the rate of curing that may affect the functionality and aesthetics of the final layer painting. Paint thinner, a solvent used in painting and decorating, for thinning oil-based paint and cleaning brushes. A Thinner may be a single solvent or a combination of solvent types. Often, specific thinners are required by the manufacturer of a coating to prevent damage to coating properties that may occur when an inappropriate thinner is used.

Solvents (for cleaning up or softening) and Thinners (for diluting or extending) are useful not only in painting but in other areas such as Wooden Furniture industry, Automobile industry, Ink industry, Rubber industry.

As the paint industry is a major consumer of Thinners & Solvents, and is expanding at a tremendous speed, it is very obvious that the demand of thinners, too, will increase tremendously. The paints & coatings accounts for the largest share in the aliphatic hydrocarbon Thinners & Solvents market. It is also projected to be the fastest-growing application of the aliphatic hydrocarbon Thinners and Solvents market.

The book contains Properties, Uses, manufacturing of Thinners & Solvents and providing information regarding thinner formulation. It also covers raw material suppliers, photographs of plant & Machinery with supplier's contact details. Some of the fundamentals of the book are thinner in Paint Industry, Health and Safety Measures of Chemicals, Pollution Control, Waste Disposal of Hazardous Chemicals and Storage, Labelling and Packaging of Chemicals etc. It will be a standard reference book for professionals and entrepreneurs. Those who are interested in this field can find the complete information from manufacture to final uses of Solvents and Thinners. It will be very helpful to consultants, new entrepreneurs, technocrats, research scholars, libraries and existing units.

## 1. SOLVENTS

Classification of Solvents

Boiling Points

Rates of Evaporation

Polarity

Industrial Applications

Use

Chemical Composition

I. Organic Solvents

II. Inorganic Solvents

Chemical Structure

Behavior Toward Magdala Red

## 2. APPLICATION OF SOLVENTS

## 3. PROPERTIES OF SOLVENTS

Introduction

Molecular Weight

Boiling Point

Freezing Point

Density

Liquid Expansion Coefficient

Surface Tension and Absolute Viscosity

Flash Point and Explosive Limits

Autoignition Temperature

Electrical Conductivity

Immediate Danger to Life and Health

## 4. ENVIRONMENTAL, HEALTH AND SAFETY REGULATION

Fire/Explosive Peroxide Formation

Health Effects

Ways Solvents Can Enter Your Body

Absorption

Swallowing

What Are the Warning Signs?

Acute Poisoning

What to Do

Chronic Poisoning After Years of Repeated

Exposures, the Typical Later Effects are

What to Do

How Solvents Affect the Skin

What to Do

How Much Exposure is Bad for You?

Environmental Contamination

Duties of Employers and Employees

Material Safety Data

Training

## 5. MANUFACTURING PROCESS OF SOLVENT

## 6. USES OF SOLVENT IN VARIOUS INDUSTRIES

Adhesives and Sealants

Common Use of Adhesive in Various Industry  
Sealants  
Common Use of Sealants in Various Industry  
Aerospace  
Acetone  
Alcohol  
Benzene  
Methyl Ethyl Ketone (MEK)  
Methylene Chloride  
Toluene  
Turpentine  
Mineral Spirits  
Naphtha  
Linseed OilAsphalt Compounding  
Biotechnology  
Biotransformation Using Solvent-Tolerant  
Microorganisms  
Solvent-Resistant Microorganisms  
Process of Solvent Toxicity for Microorganisms  
Choice of Solvent for Enzymatic Reaction in  
Organic Solvent  
Low Water Systems  
Classification of Organic Solvents  
(1) Water-Miscible Organic Solvents  
(2) Water-Immiscible Organic Solvents  
(3) Water-Insoluble Organic Solvents  
Classification of Solvents Commonly Used for  
Enzymatic Reactions in Organic Media

Properties of Enzymes Affected by Organic  
Solvents  
Thermal Stability (Half-Life),  $t_{1/2}$   
Specificity and Selectivity,  $K_{cat}/K_m$   
Coil Coating  
Cosmetics and Personal Care Products  
Electronic Industry  
Cleaning in Electronics Manufacturing  
Factors Affecting Cleaning  
Dry Cleaning  
Drycleaning Solvents  
Petroleum Drycleaning Solvents  
Dry Cleaning Processes  
Solvent Storage Tanks  
Detergents  
Process of Cleaning  
Textile Finishing  
Waterproofing  
Milling  
Antistatic Finishing  
Fabricated Metal Products  
Machining OperationsMetal Parts Cleaning and Stripping  
Solvent Cleaning  
Aqueous (Alkaline and Acid) Cleaning and

Stripping  
Abrasive Cleaning and Stripping  
Water Cleaning  
Waste Streams  
Food Industry  
Mechanical Extraction  
Solvent Extraction  
The Solvent Extraction Process  
Flow diagram of Oilseed Extraction Process  
Review of Solvents Studied for Extraction  
Efficiency  
Iron Steel Industry  
List of Solvents Releases from the Iron and Steel  
Industry  
Uses of Solvent in Ship Industry  
Cleaning Operations Using Organic Solvents  
Pulp and Paper

Printing Industry  
Pharmaceutical Industry

## 7. ACETONE

Uses  
Older Production Methods  
Uses of Acetone  
Uses of Acetone in Cosmetics  
Uses of Acetone in Laboratory  
Uses of Acetone in Electronics  
Uses of Acetone in Domestic Purpose  
Acetone Manufacturing Process  
Production  
Wacket-Hechst Direct Oxidation of Propene  
Co-production in Hock Phenol Process

## 8. CITRUS TERPENES

Properties of Terpenoids  
Citrus Terpenes for Cleaning  
d-Limonene  
Manufacturing Process

## 9. ETHYL ACETATE

Production  
Formula and Structure  
Applications  
Technical Overview  
Production of Ethyl Acetate

## 10. INDUSTRIAL ALCOHOL

Introduction  
Manufacture  
1. Bymalt Fermentation  
Manufacture Process

## 11. TETRACHLORETHYLENE

Manufacturing Process  
Chlorination of Ethylene Dichloride  
Physical and Chemical Properties  
Structural and Molecular Formulae and Relative  
Molecular Mass

## 12. TOLUENE (METHYL BENZENE)

Structure and Formula  
Various Manufacturing Process of Toluene

Alternate Catalytic Reforming Processes  
Physical and Chemical Properties of Toluene

## 13. TURPENTINE

Extraction of Turpentine from the Wood Chips  
Uses

1. Increases Efficacy of Paints and Varnish
2. Cleaning Agent
3. Stain Remover
4. Healthier Choice of a Solvent
5. Works Well as a Furniture Polish
6. Eco-Friendly

The Turpentine Value Chain

## 14. SOLVENT RECYCLING, REMOVAL AND DEGRADATION

Introduction

Process Description and Emissions

General Processes in Solvent Recycling Operations

Solvent Recycling Operations

Solvent Storage

Solvent Handling

Initial Treatment

Typical Fixed-Bed Activated Carbon Solvent

Recycling System

Distillation and Purification

Distillation Process for Solvent Recycling

Spills

Equipment Leaks

Emission Estimation Techniques: Acceptable

Reliability and Uncertainty

Direct Measurement

Mass Balance

Engineering Calculations

Emission Factors

## 15. SOLVENTS MARKET

Industrial Solvent Market

Green Solvent and Bio-Solvents Market

## 16. THINNERS

Introduction

Uses of Thinners

Types of Thinner Used in industries

Types of Thinner Based on the Paint with which it is Mixed

## 17. MANUFACTURING PROCESS

Thinner Formulation

## 18. FORMULATION OF THINNERS

Epoxy Thinner

Composition of Ingredients

Handling and Storage

Physical and Chemical Properties

Paint Thinner

Composition of Thinner

Handling and Storage

Precautions to Be Taken in Handling

Precautions to be Taken in Storing

Physical and Chemical Properties

Acrylic Thinner

Composition/Information on Ingredients

Handling and Storage

Physical and Chemical Properties

Varnish Thinner

Composition/Information on Ingredients

Handling and Storage

Handling Precautions

Incompatible Materials

Storage Conditions

Physical and Chemical Properties

## 19. THINNER IN PAINT INDUSTRY

Odorless Paint Thinner

Requirements of the Thinners

Functions of the Thinners

Properties of Paint Thinner

Solvents Used as Paint Thinners Include

Other Solvents Sometimes Used in the Production of Paint Thinners Include

## 20. HEALTH AND SAFETY MEASURES OF CHEMICALS

Health Hazards

Solvents – Thinners

How to Control Health Hazards Environmental Control

Use Appropriate Personal Protection

Respirators

Eye and Hearing Protection

Protective Clothing

Handling and Storage

Accidental Release Measures

Precautions

Spill or Leak

Do Not Get Water Inside Containers

Fire and Explosion Hazards

Things to Do and Not to do Before Mixing Thinner in Paint

Material Safety Data Sheet  
What is a Material Safety Data Sheet (MSDS)?  
What is the Purpose of an MSDS?  
What information is on the MSDS?  
Reactivity Data  
Why is an MSDS Hard to Read?  
When Would We Use an MSDS?  
Hazard Communication Standard  
Solvents

## 21. POLLUTION CONTROL

Environmental Concerns  
Pollution Caused by Thinner  
Major Emissions  
Impacts on Human Health and Environment  
What is Pollution Prevention?  
Methods for Reducing the Pollution

## 22. WASTE DISPOSAL OF HAZARDOUS CHEMICALS AND STORAGE

General Requirements for Storage of Chemicals  
Prohibited and Restricted Hazardous Chemicals  
Exposure Standards  
Identifying Hazards Hazardous Chemicals Generated or Manufactured in the Workplace  
Segregate Incompatibles  
Segregate Families

Flammable Liquid Storage  
Classifications of Flammable and Combustible  
Liquids  
Flammable Liquids  
Combustible Liquids  
Corrosive Storage  
Transporting Chemicals  
Hazardous Waste Disposal  
General Requirements for Waste Disposal  
Standard of Containers  
Containers to be Resistant to the Contents  
Containers should be in Good Condition  
Containers to be Securely Closed  
No Mixing of Incompatible Wastes in a Container  
Sufficient Air Space in Containers When Storing  
Liquid Wastes  
Disposal of Paint Related Materials  
Hazardous Waste Minimization  
Process Level Impacts

## 23. B.I.S. SPECIFICATIONS OF SOLVENTS AND THINNERS

Solvents  
Thinner

## 24. LABELLING AND PACKAGING OF CHEMICALS

Introduction  
General Requirements of Labelling and Packaging in Accordance with the Chemical Labelling &

Packaging (CLP) Regulation  
General Labelling Rules  
Elements of the CLP Hazard Label  
CLP Labelling Requirements Versus Discretion of the Supplier Classification of Hazardous Substance/Mixtures  
Updating the Hazard Label  
Labelling of Workplace Chemicals  
Hazard Labels for Supply and Transport Outer and

Inner Packaging Classified for Supply but not for Transport  
Outer and Inner Packaging Classified for Both  
Transport and Supply  
Single Packaging Classified Under Both Supply and Transport  
CLP Rules on Packaging of Substances and  
Mixtures  
Child-Resistant Fastening and Tactile Warnings of  
Danger  
Child-Resistant Fastening (CRF)  
Tactile Warning of Danger (TWD)  
Hazard Pictograms  
Shape, Colour and Dimensions  
Precedence Rules  
Blank Pictograms  
Signal Words  
Hazard Statements  
Precautionary Statements  
Codes for Hazard and Precautionary Statements  
Code Ranges of Hazard and Precautionary  
Statements Under CLP  
Guidance on Particular Aspects of CLP Hazard  
Labelling  
Further Aspects to Consider for the CLP Hazard  
Label  
Size of the Label and of the Label Elements  
Minimum Dimensions of Labels and Pictograms Under CLP

25. PROCESS FLOW DIAGRAM

26. SAMPLE PLANT LAYOUT

27. PHOTOGRAPHS OF MACHINERY WITH SUPPLIER'S CONTACT DETAILS

## About NIIR

**NIIR PROJECT CONSULTANCY SERVICES (NPCS)** is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-



up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. 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.

---

**NIIR PROJECT CONSULTANCY SERVICES**, 106-E, Kamla Nagar, New Delhi-110007, India.  
**Email:** [npcs.india@gmail.com](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Sat, 17 May 2025 09:28:52 +0000