

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

FireExplosive 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 Oil Asphalt 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 Operations Metal 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 **Website:** NIIR.org

Mon, 18 Aug 2025 21:01:43 +0000