

# The Global Market for Lignin 2023-2033

<https://marketpublishers.com/r/GD1164494F64EN.html>

Date: February 2023

Pages: 140

Price: US\$ 1,250.00 (Single User License)

ID: GD1164494F64EN

## Abstracts

The increasing concerns of environmental pollution and shortage of petroleum resources have fuelled substantial research towards valorization of bio-based polymers. Lignin is the second most abundant renewable biopolymer on Earth and the largest natural source of aromatic monomers. Its industrial use has attracted considerable attention because of its advantages of high carbon content, low cost and bio-renewability. Lignin is an important precursor for sustainable synthesis of chemicals, polymers, and materials to replace or augment current petroleum-based counterparts.

Wood pulping and other biorefinery industries extract more than 50 million tonnes of lignin annually, but only ~2% is recovered for utilization in applications. However, its use as a 'green' feedstock for fuels, chemicals, and materials is growing through the commercialization of extraction technologies coupled with transitioning towards biorefinery processes.

Lignin has mainly been produced as an industrial residue of pulp and paper factories (e.g. a by-product of the Kraft process), and the majority of the several millions tons of lignin produced annually are utilized as a low-cost fuel for power and heat generation. Due to continued greening (i.e. renewable feedstock) of the global economy, new applications are being commercialized. For example, lignin-based renewable functional fillers are used in different rubber applications as a sustainable alternative to carbon black and silica. Recent developments include use of lignin as a carbon additive in li-ion batteries., due to increased demand for sustainable and environmentally friendly energy storage.

The Global Market for Lignin 2023-2033 includes:

Market description and future outlook.

## Analysis of processes used to extract and refine lignin

Production capacities of lignin producers.

In depth analysis of biorefinery lignin production.

Markets and applications for lignin. Markets covered include aromatic compounds (e.g. Benzene, toluene and xylene; Vanillin; Phenol and Phenolic resins); Plastics and polymers; Hydrogels; Concrete; Rubber; Bitumen and Asphalt; Biofuels; Energy storage; Binders, emulsifiers and dispersants; Chelating agents; Ceramics; Automotive; Fire retardants; Antioxidants; Lubricants; Dust Control.

Market demand for lignin in metric tonnes, forecast to 2033.

Industry developments 2020-2023.

Profiles of 79 lignin producers. Profiles include company description, products, processes and capacities. Companies profiled include Bloom Biorenewables SA, Clariant, FP Innovations, Klabin SA, Lignin Industries, Lignolix, Inc., Lignopure, Lignovations GmbH, MetGen Oy, Praj Industries Ltd., Spero Renewables, Stora Enso, Sumitomo Bakelite Co. Ltd., UPM, Versalis SpA and RenCom AB.

## Contents

### 1 RESEARCH METHODOLOGY

### 2 INTRODUCTION

- 2.1 What is lignin?
  - 2.1.1 Lignin structure
- 2.2 Types of lignin
  - 2.2.1 Sulfur containing lignin
  - 2.2.2 Sulfur-free lignin from biorefinery process
- 2.3 Properties
- 2.4 The lignocellulose biorefinery
- 2.5 Markets and applications
- 2.6 Challenges for using lignin

### 3 LIGNIN PRODUCTION PROCESSES

- 3.1 Lignosulphonates
- 3.2 Kraft Lignin
  - 3.2.1 LignoBoost process
  - 3.2.2 LignoForce method
  - 3.2.3 Sequential Liquid Lignin Recovery and Purification
  - 3.2.4 A-Recovery+
- 3.3 Soda lignin
- 3.4 Biorefinery lignin
  - 3.4.1 Commercial and pre-commercial biorefinery lignin production facilities and processes
- 3.5 Organosolv lignins
- 3.6 Hydrolytic lignin

### 4 MARKETS FOR LIGNIN

- 4.1 Market drivers and trends for lignin
- 4.2 Lignin industry developments 2020-2023
- 4.3 Production capacities
  - 4.3.1 Technical lignin availability (dry ton/y)
  - 4.3.2 Biomass conversion (Biorefinery)
- 4.4 Estimated consumption of lignin

- 4.5 Prices
- 4.6 Heat and power energy
- 4.7 Pyrolysis and syngas
- 4.8 Aromatic compounds
  - 4.8.1 Benzene, toluene and xylene
  - 4.8.2 Phenol and phenolic resins
  - 4.8.3 Vanillin
- 4.9 Plastics and polymers
- 4.10 Hydrogels
- 4.11 Carbon materials
  - 4.11.1 Carbon black
  - 4.11.2 Activated carbons
  - 4.11.3 Carbon fiber
- 4.12 Concrete
- 4.13 Rubber
- 4.14 Bitumen and Asphalt
- 4.15 Fuels
- 4.16 Energy storage
  - 4.16.1 Supercapacitors
  - 4.16.2 Anodes for lithium-ion batteries
  - 4.16.3 Gel electrolytes for lithium-ion batteries
  - 4.16.4 Binders for lithium-ion batteries
  - 4.16.5 Cathodes for lithium-ion batteries
  - 4.16.6 Sodium-ion batteries
- 4.17 Binders, emulsifiers and dispersants
- 4.18 Chelating agents
- 4.19 Ceramics
- 4.20 Automotive interiors
- 4.21 Fire retardants
- 4.22 Antioxidants
- 4.23 Lubricants
- 4.24 Dust control

## **5 COMPANY PROFILES 61 (79 COMPANY PROFILES)**

## **6 REFERENCES**

## List Of Tables

### LIST OF TABLES

- Table 1. Technical lignin types and applications.
- Table 2. Classification of technical lignins.
- Table 3. Lignin content of selected biomass.
- Table 4. Properties of lignins and their applications.
- Table 5. Example markets and applications for lignin.
- Table 6. Processes for lignin production.
- Table 7. Biorefinery feedstocks.
- Table 8. Comparison of pulping and biorefinery lignins.
- Table 9. Commercial and pre-commercial biorefinery lignin production facilities and processes
- Table 10. Market drivers and trends for lignin.
- Table 11. Lignin industry developments 2020-2023.
- Table 12. Production capacities of technical lignin producers.
- Table 13. Production capacities of biorefinery lignin producers.
- Table 14. Estimated consumption of lignin, 2019-2033 (000 MT).
- Table 15. Lignin aromatic compound products.
- Table 16. Prices of benzene, toluene, xylene and their derivatives.
- Table 17. Lignin products in polymeric materials.
- Table 18. Application of lignin in plastics and composites.
- Table 19. Lignin products in fuels.
- Table 20. Lignin-derived anodes in lithium batteries.
- Table 21. Application of lignin in binders, emulsifiers and dispersants.

## List Of Figures

### LIST OF FIGURES

- Figure 1. High purity lignin.
- Figure 2. Lignocellulose architecture.
- Figure 3. Extraction processes to separate lignin from lignocellulosic biomass and corresponding technical lignins.
- Figure 4. The lignocellulose biorefinery.
- Figure 5. Lignocellulosic biomass conversion and products.
- Figure 6. LignoBoost process.
- Figure 7. LignoForce system for lignin recovery from black liquor.
- Figure 8. Sequential liquid-lignin recovery and purification (SLPR) system.
- Figure 9. A-Recovery+ chemical recovery concept.
- Figure 10. Schematic of a biorefinery for production of carriers and chemicals.
- Figure 11. Organosolv lignin.
- Figure 12. Hydrolytic lignin powder.
- Figure 13. Estimated consumption of lignin, 2019-2033 (000 MT).
- Figure 14. Schematic of WISA plywood home.
- Figure 15. Lignin based activated carbon.
- Figure 16. Lignin/cellulose precursor.
- Figure 17. Functional rubber filler made from lignin.
- Figure 18. Road repair utilizing lignin.
- Figure 19. Prototype of lignin based supercapacitor.
- Figure 20. ANDRITZ Lignin Recovery process.
- Figure 21. DAWN Technology Process.
- Figure 22. BALI technology.
- Figure 23. Pressurized Hot Water Extraction.
- Figure 24. sunliquid production process.
- Figure 25. Domsj? process.
- Figure 26. TMP-Bio Process.
- Figure 27. Flow chart of the lignocellulose biorefinery pilot plant in Leuna.
- Figure 28. AVAPTM process.
- Figure 29. GreenPower+ process.
- Figure 30. Lignin gel.
- Figure 31. BioFlex process.
- Figure 32. LX Process.
- Figure 33. METNIN Lignin refining technology.
- Figure 34. Enfinity cellulosic ethanol technology process.

Figure 35: Plantrose process.

Figure 36. Hansa lignin.

Figure 37. Stora Enso lignin battery materials.

Figure 38. Solid Novolac Type lignin modified phenolic resins.

Figure 39. UPM biorefinery process.

Figure 40. The Proesa Process.

Figure 41. Goldilocks process and applications.

## I would like to order

Product name: The Global Market for Lignin 2023-2033

Product link: <https://marketpublishers.com/r/GD1164494F64EN.html>

Price: US\$ 1,250.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/GD1164494F64EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:  
Last name:  
Email:  
Company:  
Address:  
City:  
Zip code:  
Country:  
Tel:  
Fax:  
Your message:

**\*\*All fields are required**

Customer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970