

Global PCB Brown Oxide Treatment Lines Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global PCB Brown Oxide Treatment Lines market size was valued at US\$ 108 million in 2025 and is forecast to a readjusted size of US\$ 162 million by 2032 with a CAGR of 5.7% during review period.

PCB brown oxide treatment lines are horizontal wet process equipment used for inner layer copper surface treatment before multilayer PCB, HDI board, IC substrate, and high reliability printed circuit board lamination. Their core function is to create a controlled micro roughened or organometallic bonding surface on copper, improving adhesion between copper layers and prepreg or resin systems during lamination. A typical line consists of loading, degreasing, micro etching, activation, brown oxide reaction, multi stage rinsing, drying, cooling, unloading, chemical circulation, temperature control, spray modules, filtration, automatic dosing, and PLC based process control. Key specifications include working board width, conveyor speed, treatment length, spray pressure, bath temperature, line material, cleanliness level, chemical compatibility, automation level, and recipe control capability. These systems are mainly used in high layer count server PCBs, telecom boards, automotive electronics boards, consumer electronics boards, industrial control boards, rigid flex boards, and IC substrates where stable interlayer bonding is critical. In 2025, the global average price of PCB brown oxide treatment lines was about US\$430,000 per unit, the average industry gross margin was around 30%?38%, and global shipments were approximately 245 units.

PCB brown oxide treatment lines form a narrow but important segment within PCB wet process equipment. Their value is concentrated in inner layer copper surface preparation before multilayer lamination, rather than in general PCB production

equipment. The upstream supply chain includes stainless steel and engineered plastic tanks, spray systems, pumps, valves, piping, filters, heaters, temperature control modules, sensors, PLC control systems, motors, conveyors, and process chemicals. The midstream consists of line design, equipment manufacturing, process integration, installation, commissioning, and after sales support. The downstream market mainly includes multilayer PCB, HDI, high speed communication board, AI server PCB, automotive electronics board, industrial control board, and IC substrate manufacturers. As PCB products move toward higher layer counts, finer lines, tighter process windows, and higher reliability requirements, the role of brown oxide treatment lines is increasingly linked to yield stability, interlayer adhesion, and long term board reliability.

The competitive landscape is regional and specialized rather than broadly consolidated. European and North American suppliers tend to have stronger capabilities in process integration, oxide replacement technologies, and high end horizontal wet process lines. Taiwan based equipment companies have long served the PCB wet process market and are competitive in customization, practical engineering, and customer support. Mainland Chinese suppliers are gaining share through local delivery, cost efficiency, faster installation cycles, and closer service to expanding domestic PCB capacity. The relocation and expansion of PCB manufacturing capacity in Mainland China and Southeast Asia are also reshaping the supply chain. In parallel, industry consolidation and technology integration are pushing some suppliers to combine chemicals, process know how, and equipment platforms, making the product less like a standalone mechanical line and more like an integrated process equipment solution.

The policy and demand environment remains generally supportive. Electronics supply chain localization, high end PCB substitution, server and communication infrastructure investment, automotive electronics growth, and IC substrate capacity expansion all support demand for stable inner layer treatment equipment. However, this is still a mature process equipment category, and growth is limited by the relatively small number of lines required per PCB factory, the long service life of existing equipment, chemical process lock in, and price competition among Asian suppliers. Future opportunities will mainly come from high layer count boards, AI server PCBs, HDI and substrate capacity additions, automation upgrades, energy saving retrofits, cleaner process control, and gradual penetration of oxide replacement routes. Overall, PCB brown oxide treatment lines should be viewed as a stable growth niche driven by high end PCB structural upgrading rather than a high volume, fast replacement equipment market.

This report is a detailed and comprehensive analysis for global PCB Brown Oxide

Treatment Lines market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global PCB Brown Oxide Treatment Lines market size and forecasts, in consumption value (\$ Million), sales quantity (Units), and average selling prices (K US\$/Unit), 2021-2032

Global PCB Brown Oxide Treatment Lines market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (Units), and average selling prices (K US\$/Unit), 2021-2032

Global PCB Brown Oxide Treatment Lines market size and forecasts, by Type and by Application, in consumption value (\$ Million), sales quantity (Units), and average selling prices (K US\$/Unit), 2021-2032

Global PCB Brown Oxide Treatment Lines market shares of main players, shipments in revenue (\$ Million), sales quantity (Units), and ASP (K US\$/Unit), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for PCB Brown Oxide Treatment Lines

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global PCB Brown Oxide Treatment Lines market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include MKS Instruments, Inc., SCHMID

Group, Kunshan Dongwei Technology Co., Ltd., Shenzhen Tianhua Machine Equipment Co., Ltd., Hi Ji Co., Ltd., Lian Yih Technology Co., Ltd., SONGTEX TECHNOLOGY CO., LTD., Universal Circuit Board Equipment Co., Ltd., Wise S.r.l., AMPOC Far East Co., Ltd., etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

PCB Brown Oxide Treatment Lines market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Type

Conventional Brown Oxide Treatment Lines

Black and Brown Oxide Convertible Lines

Oxide Replacement Treatment Lines

Micro Roughening Adhesion Promotion Lines

Others

Market segment by Board Type

Multilayer PCB Lines

HDI PCB Lines

IC Substrate Lines

Rigid Flex PCB Lines

Others

Market segment by Equipment Configuration

Horizontal Conveyorized Lines

Vertical Wet Process Lines

Others

Market segment by Application

Telecom and Networking Equipment

Automotive Electronics

Consumer Electronics

Industrial Medical

Others

Major players covered

MKS Instruments, Inc.

SCHMID Group

Kunshan Dongwei Technology Co., Ltd.

Shenzhen Tianhua Machine Equipment Co., Ltd.

Hi Ji Co., Ltd.

Lian Yih Technology Co., Ltd.

SONGTEX TECHNOLOGY CO., LTD.

Universal Circuit Board Equipment Co., Ltd.

Wise S.r.l.

AMPOC Far East Co., Ltd.

Market segment by region, regional analysis covers

North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe PCB Brown Oxide Treatment Lines product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of PCB Brown Oxide Treatment Lines, with price, sales quantity, revenue, and global market share of PCB Brown Oxide Treatment Lines from 2021 to 2026.

Chapter 3, the PCB Brown Oxide Treatment Lines competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the PCB Brown Oxide Treatment Lines breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and PCB Brown Oxide Treatment Lines market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of PCB Brown Oxide Treatment Lines.

Chapter 14 and 15, to describe PCB Brown Oxide Treatment Lines sales channel, distributors, customers, research findings and conclusion.

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