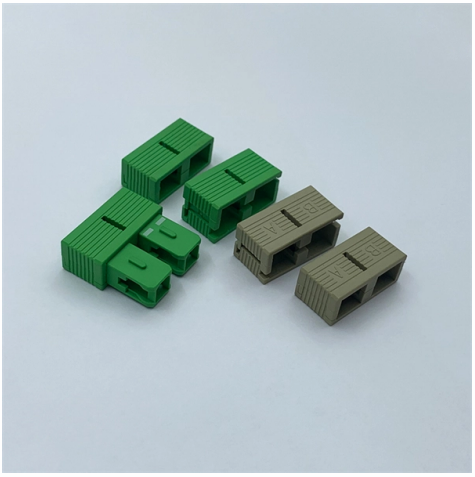
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Value of Raw Materials for Optical Modules



Overview

Optical Communication Raw Material Prices Surge 144% in 2026 | HCHSince the start of 2026, a global surge in raw material prices has swept the optical comm.

Key Takeaways

Raw materials account for 60%-70% of the total cost of optical modules, with metals, semiconductors, and optical fibers being the primary contributors.Cost Composition of Optical Modules

Optical modules are high-tech components used in data transmission, and their cost structure is heavily influenced by raw materials. Metals such as gold, copper, tin, and aluminum are critical for connectors, PCB boards, and heat sinks. For example, gold-plated contact points (gold fingers) ensure signal stability and corrosion resistance, while copper cores and alloy shells provide conductivity and structural integrity. Auxiliary materials like tin solder and metal heat sinks further increase raw material costs, making metals a major cost driver . Semiconductors, including lasers, silicon chips, and specialty ICs, also contribute significantly to the raw material value. These components are essential for high-speed data transmission and signal processing, and their prices fluctuate with global semiconductor markets .

Optical Fiber Materials

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Optical fibers themselves are made from glass or plastic preforms, which are drawn into thin strands for data transmission. The global optical fiber raw material market was valued at USD 1.12 billion in 2024 and is projected to grow at a CAGR of 11.8% from 2025 to 2032, reflecting increasing demand from 5G, IoT, and data center expansion . Another analysis estimates the broader optical fiber raw material market at USD 31.19 billion in 2024, expected to reach USD 86.46 billion by 2035, driven by telecom infrastructure investments and high-speed internet demand .

Impact on Module Pricing and Profitability

Rising raw material costs directly affect profit margins. Low- and medium-speed modules (10G, 25G) have gross margins of 15%-20%, while high-speed modules (100G, 400G) range from 25%-40%. Price increases in metals like gold and copper can raise the cost of a single 100G module by 8-10 yuan, which, for large production volumes, translates into hundreds of thousands of yuan in additional monthly costs . Manufacturers mitigate these pressures through cost control, material substitution, and supply chain optimization, while procurement strategies focus on vendor evaluation, demand forecasting, and selecting modules that support scalability and multi-speed operations .

Summary

In summary, raw materials constitute the majority of optical module costs, with metals, semiconductors, and optical fibers being the most significant contributors. Market trends indicate rising demand and price volatility, making strategic procurement and cost management essential for maintaining profitability in the optical communications industry .

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