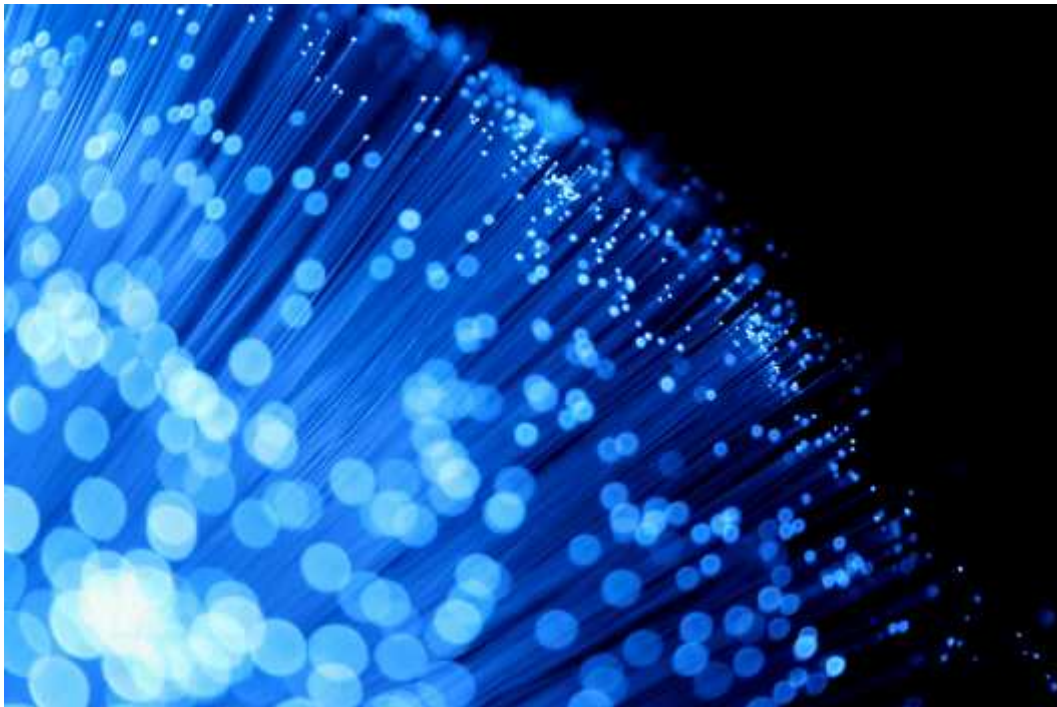


Announcement

Fiber Optic Communications Collimator Lens Assemblies Global Market Forecast 2015-2021



This report presents the ElectroniCast worldwide forecast of the consumption of small-beam component-level collimating lens single-fiber and array assemblies in optical communication passive, active and integrated components/devices



Fiber Optic Communications Collimator Lens Assemblies Global Market Forecast and Analysis

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Excel File: Market Forecast Database (2015-2021)
PowerPoint File: Summary Data Figures
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This is the ElectroniCast Global Forecast of consumption forecast of small beam collimating lens assemblies in fiber optic communication (including telecommunication, datacom and cable TV) passive and active/integrated (hybrid) components/devices. The years of coverage, in the market review and forecast, are: 2015-2021. ¹

ElectroniCast defines lens assemblies as “loose” lenses (one or more), which are attached to an optical fiber or fitted/attached into (or on) a planar waveguide/array substrates or other device(s), such as a ferrule, for the purpose of collimating light for optical *fiber* communication.

The market forecast data are presented for fiber optic collimator lens assemblies, which are used in optical communications applications. The data are segmented by the following functions:

- Consumption Value (US\$, million)
- Quantity (number/units x Thousand)
- Average Selling Prices (ASP \$, each)

The consumption value is determined by multiplying the number of units by the average selling price. The average selling prices are based on the price of the fiber optic collimator assembly at the initial factory level. The market data are segmented into the following geographic regions, plus a Global summary:

- America (North, Central and South America)
- EMEA (Europe, Middle Eastern countries, plus Africa)
- APAC (Asia Pacific)

¹ All values and prices in this report are at factory as-shipped levels, and are in current dollars, which include the effect of a forecasted 5 percent annual inflation rate over the forecast period.

Collimator lenses (and lens assemblies) are used in a variety of photonic products; however this report presents the use of micro-sized collimator lens assemblies, which are used specifically in optical communication components, such as some of the following:

- Modulators; Attenuators; Transmitter
- Pump laser modules
- Photonic Switch/Optical Cross Connects
- Wavelength Selective Switch, ROADMs
- Isolators; Interleavers; Circulators
- Expanded-beam connector assemblies
- Optical filter modules, DWDM, Tunable Filters
- Optical sensors
- Optical signal processing
- Integrated/hybrid packaged modules
- Other active and passive components

Fiber Optics industry is in a growth mode. We are now seeing the expansion, such as "Green-Field" (new-builds), and DWDM use and the continuance of the "lighting-up" of "dark fiber". The fiber optics industry is now observing an impressive increase in the consumption of the optical elements and components that facilitate a strong environment for the use of collimator lenses (and lens assemblies).

Most of this activity is driven by the expansion of fiber optic transport and access networks, mainly in telecommunications. The private data communication, cable TV, as well as the specialty and instrumentation market segments, also will drive the market of lenses used for collimating the optical signal (light). Fiber optic collimators have been used in conjunction with optical isolators, optical circulators and any other passive or active optical function, which requires converting divergent beams of radiation or particles, such as light rays, into parallel beams. Fiber collimators are widely used in a variety of optical applications, as noted previously.

Commercially available fiber collimator arrays have typically implemented separate lenses, which has increased the cost of the array. For example, one commercially available collimator array has utilized a V-groove array substrate with individually aligned graded-index (GRIN) micro-lens and fibers in each V-groove. These GRIN micro-lens have generally been produced by an ion-exchange process and normally provide high coupling efficiency and have been utilized as collimators for laser beam printers, bar code scanners, optical isolators, optical circulators and DVD players, as well as miniature objective lenses for medical/industrial endoscopes. Planar micro-lens arrays are one or two-dimensional (2-D) lens arrays formed on a substrate and may include numerous microscopic lenses in various sizes and patterns.

Collimator lens assemblies used in miscellaneous active components (such as emitters/transceivers, other) and integrated components (combination of functions in one package, which can include passive and active functions) are forecast to increase in value to \$100 million in the year 2021. Market forecast data in the ElectroniCast report refers to consumption (use) for a particular calendar year; therefore, this data is not cumulative data.

This 2015-2021 forecast and analysis of collimator lens assembly consumption is presented for each significant function or product. Company profiles of selected competitors and associated/related companies are provided, as well as market share estimates for last year.

The information is presented in easy-to-follow illustrations and text. The reasons for the forecasted trends are discussed. A global summary also is provided. The report also outlines the market research methodology followed and the key assumptions made. Terms, acronyms, and abbreviations used are defined.

Information Base

This study is based on analysis of information obtained continually over the past two decades, but updated through early-September 2016. During this period, ElectroniCast analysts performed interviews with authoritative and representative individuals in the fiber optics, telecommunications, datacom, cable TV and other communication industries, from the standpoint of both suppliers and users of fiber optic transmission links. The interviews were conducted principally with:

- Engineers, marketing personnel and management at manufacturers of fiber optic circulators, collimators, specialty fiber, connectors, isolators, couplers, DWDM filter modules, dispersion compensators, photonic switches, attenuators, modulators, transmitters/receivers, OADMs and other related optical communication components.
- Engineers, marketing, purchasing personnel and market planners at major users of passive and active optical components, such as telecommunication transmission, switching, distribution and apparatus equipment, telephone companies, data communications equipment companies, cable TV system suppliers, and a number of other end users of fiber optic communication components and technology.

The interviews covered issues of technology, pricing, contract size, reliability, documentation, installation/maintenance crafts, standards, supplier competition and other topics.

A full review of published information was also performed to supplement information obtained through interviews. The following sources were reviewed:

- Professional technical journals and papers; Trade press articles
- Technical conference proceedings
- Additional information based on previous ElectroniCast market studies, including the Fiber Optic Forecast Service Data Base, the Fiber Optic Cable Forecast, the Optical Amplifier and Component Global Forecast, the Intraenclosure Optical Interconnect Forecast, the Fiber Optic Installation Apparatus Forecast, the Fiber Optic Circulator Forecast, Fiber Optic Coupler, Attenuator, Isolator, Filter, DWDM, Switch, Optical Add/Drop Multiplexers, Transmitters/Receivers, SONET/SDH, and other related component Market Forecasts
- Personal knowledge of the research team

In analyzing and forecasting the complexities of the Global market for fiber optic communication components, it is essential that the market research team have a good and a deep understanding of the technology and of the industry. ElectroniCast members who participated in this report were qualified.

Bottom-up Methodology ElectroniCast forecasts are developed initially at the lowest detail level and then summed to successively higher levels. The background market research focuses on the amount of each type of product used in each application in the base year (last year: 2014), and the prices paid at the first transaction from the manufacturer. This forms the base year data. ElectroniCast analysts then forecast the growth rates in component quantity use in device type, along with price trends, based on competitive, economic and technology forecast trends, and apply these to derive long term forecasts at the lowest application (use) levels. The usage growth rate forecasts depend heavily on analysis of overall end user trends toward digital broadband communication equipment usage and economic payback.

Cross-Correlation Increases Accuracy The quantities of fiber optic attenuators, DWDM, optical fiber/cable, connectors, transceivers, transport terminals, optical add/drop MUX, couplers/splitters, isolators, photonic switches and other products used in a particular application are interrelated. Since ElectroniCast conducts annual analysis and forecast updates in each fiber optic related product field, accurate current quantity estimates in each application are part of this corporate database. These quantities are cross-correlated as a “sanity check.”

ElectroniCast, each year since 1985, has conducted extensive research and updated their forecasts of each fiber optic component category. As technology and applications have advanced, the number of component subsets covered by the forecasts has expanded impressively.

About ElectroniCast

ElectroniCast, founded in 1981, specializes in forecasting technology and global market trends in fiber optics communication components and devices, as well providing market data on light emitting diodes used in lighting.

As an independent consultancy we offer multi-client and custom market research studies to the world's leading companies based on comprehensive, in- depth analysis of quantitative and qualitative factors. This includes technology forecasting, markets and applications forecasting, strategic planning, competitive analysis, customer-satisfaction surveys and marketing/sales consultation. ElectroniCast, founded as a technology-based independent consulting firm, meets the information needs of the investment community, industry planners and related suppliers.

Director of Study

Stephen Montgomery, MBA in Technology Management, President at ElectroniCast Consultants. He joined ElectroniCast in 1990 and has specialized in photonics and fiber optic components market & technology forecasting at ElectroniCast for over 25-years. He has given numerous presentations and published a number of articles on optical communication markets, technology, applications and installations. He is a member of the Editorial Advisory Board of LIGHTWAVE magazine (PennWell Publishing) and writes a monthly article covering the optical communication industry for OPTCOM Magazine in Japan (Kogyo Tsushin Co., Ltd.).

Proprietary Statement

All data and other information contained in this data base are proprietary to ElectroniCast and may not be distributed or provided in either original or reproduced form to anyone outside the client's internal employee organization, without prior written permission of ElectroniCast.

ElectroniCast, in addition to multiple-client programs, conducts proprietary custom studies for single clients in all areas of management planning and interest. Other independent consultants, therefore, are considered directly competitive. ElectroniCast proprietary information may not be provided to such consultants without written permission from ElectroniCast Consultants.

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EXCEL – ElectroniCast Data Base Market Forecast Spreadsheets
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- America
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