Raw Materials

Corning's manufacturing processes and products require access to uninterrupted power sources, significant quantities of industrial water, certain precious metals, and various batch materials. Availability of resources (ores, minerals, polymers, helium and processed chemicals) required in manufacturing operations, appears to be adequate. Corning's suppliers, from time to time, may experience capacity limitations in their own operations, or may eliminate certain product lines. Corning believes it has adequate programs to ensure a reliable supply of raw and batch materials as well as precious metals. For many of its materials, Corning has alternate suppliers that would allow operations to continue without interruption in the event of specific materials shortages.

Certain key materials and proprietary equipment used in the manufacturing of products are currently sole-sourced or available only from a limited number of suppliers. To minimize this risk, Corning closely monitors raw materials and equipment with limited availability or which are sourced through one supplier. However, any future difficulty in obtaining sufficient and timely delivery of components and/or raw materials could result in lost sales due to delays or reductions in product shipments, or reductions in Corning's gross margins.

Patents and Trademarks

Inventions by members of Corning's research and engineering staff continue to be important to the Company's growth. Patents have been granted on many of these inventions in the United States and other countries. Some of these patents have been licensed to other manufacturers. Many of our earlier patents have now expired, but Corning continues to seek and obtain patents protecting its innovations. In 2018, Corning was granted about 520 patents in the U.S. and over 1,430 patents in countries outside the U.S.

Each business segment possesses a patent portfolio that provides certain competitive advantages in protecting Corning's innovations. Corning has historically enforced, and will continue to enforce, its intellectual property rights. At the end of 2018, Corning and its wholly-owned subsidiaries owned over 11,600 unexpired patents in various countries of which over 4,400 were U.S. patents. Between 2019 and 2021, approximately 11% of these patents will expire, while at the same time Corning intends to seek patents protecting its newer innovations. Worldwide, Corning has about 10,300 patent applications in process, with about 2,500 in process in the U.S. Corning believes that its patent portfolio will continue to provide a competitive advantage in protecting the Company's innovation, although Corning's competitors in each of its businesses are actively seeking patent protection as well.

While each of our reportable segments has numerous patents in various countries, no one patent is considered material to any of these segments. Important U.S.-issued patents in our reportable segments include the following:

- Display Technologies: patents relating to glass compositions and methods for the use and manufacture of glass substrates for display applications.
- Optical Communications: patents relating to (i) optical fiber products including low-loss optical fiber, high data rate optical fiber, and dispersion compensating fiber, and processes and equipment for manufacturing optical fiber, including methods for making optical fiber preforms and methods for drawing, cooling and winding optical fiber; (ii) optical fiber ribbons and methods for making such ribbon, fiber optic cable designs and methods for installing optical fiber cable; (iii) optical fiber connectors, hardware, termination and storage and associated methods of manufacture; and (iv) distributed communication systems.
- Environmental Technologies: patents relating to cellular ceramic honeycomb products, together with ceramic batch and binder system compositions, honeycomb extrusion and firing processes, and honeycomb extrusion dies and equipment for the high-volume, low-cost manufacture of such products.
- Specialty Materials: patents relating to protective cover glass, ophthalmic glasses and polarizing dyes, and semiconductor/microlithography optics and blanks, metrology instrumentation and laser/precision optics, glass polarizers, specialty fiber, and refractories.
- Life Sciences: patents relating to methods and apparatus for the manufacture and use of scientific laboratory equipment including multiwell plates and cell culture products, as well as equipment and processes for label independent drug discovery.

Products reported in All Other include development projects, new product lines, and other businesses or investments that do not meet the threshold for separate reporting.

Approximate number of patents granted to our reportable segments follows:

	Number of patents worldwide	U.S. patents	Important patents expiring between 2019 and 2021
Display Technologies	1,700	340	6
Optical Communications	5,060	2,340	27
Environmental Technologies	1,100	380	14
Specialty Materials	1,600	680	7
Life Sciences	560	240	1

Many of the Company's patents are used in operations or are licensed for use by others, and Corning is licensed to use patents owned by others. Corning has entered into cross-licensing arrangements with some major competitors, but the scope of such licenses has been limited to specific product areas or technologies.

Corning's principal trademarks include the following: Axygen, Corning, Celcor, ClearCurve, DuraTrap, Eagle XG, EDGE8, Gorilla, HPFS, LEAF, PYREX, Steuben, Falcon, SMF-28e, UniCam, Valor, Willow, LOTUS and IRIS.