chemical and industrial applications. Sprout-Waldron's production capacity was increased.

- Demand was strong for piston rings for diesel engines and shaft seals for aircraft engines. Unit volume gains, better productivity and improved prices exerted a positive influence on performance in this area. The piston ring replacement parts business continues to expand.
- Overcapacity continued in the corrugated box industry. Although operating levels did not improve in the container machinery line, the loss was reduced from the prior year. Cost overruns and production inefficiencies were responsible for a loss in the mineral processing equipment line.
- The Group's line of environmental control products showed increased sales from the capital spending and nonresidential construction markets. Profits were mixed, as sound control and water treatment systems were strong while air cleaning products and air handling systems had disappointing performances.
- Aircraft and gas turbine silencing markets were the major forces in sound control strengths. In water treatment, the Group is benefiting from Federal funding to municipalities for sewage treatment systems.

Backlog

Engineered Metal Products backlog at the end of 1978 was $198 million, compared with $154.8 million a year earlier. The total backlog is believed to be firm, and approximately 90% is expected to be shipped in 1979. There are no significant seasonal factors that influence the backlog each year.

Engineered Metal Products Business

Engineered Metal Products designs and manufactures processing machinery systems, machine components and environmental control systems. These business lines are generally characterized by high-value-added products that are precision-engineered, of high quality, and designed to rigid customer specifications.

Engineered Metal Products 1978 Sales by End Market	($ Millions)	%
Paper and Packaging	$ 67.9	24
Machinery	28.7	10
Transportation	27.2	10
Agriculture	22.4	8
Utilities	22.2	8
Nonferrous Metals and Mining	21.6	8
Chemical, Plastics and Rubber	20.2	7
Architectural Construction	18.6	7
Iron and Steel	15.9	6
Engineered Construction	6.7	2
Other	34.2	10
	$285.6	100

Sprout-Waldron products include processing machinery for the formula feed, food, chemical, pulp and paper, and other basic industries. Sprout-Waldron also designs and builds complete feed mills, material handling and storage facilities, pulping plants and industrial processing installations.

HARDINGE crushers, grinders and related equipment are produced for the processing of coal and other minerals.

Koppers corrugated container machinery converts kraft paper into corrugated board. The Company also manufactures machinery to make the board into finished containers for packaging producers.

Koppers is a major producer of industrial piston rings for diesel engines and shaft seals for use in aircraft engines, pumps and compressors, as well as seal rings for hydraulic cylinders, valves and other industrial and aircraft applications.

Koppers supplies a broad range of power transmission couplings. These transmit power from one rotating shaft to another and compensate for misalignment. Applications range from main drives in steel rolling mills to single-motor drives on pumps.

Environmental control capabilities include the design, manufacture, erection and marketing of systems for air cleaning, air handling, sound control and water treatment.

Raw Materials and Fuel

Principal raw materials, such as metal castings and forgings, are produced within Engineered Metal Products facilities, with some quantities purchased from commercial producers. Steel bars, billets, plates, structural forms and aluminum are purchased from mill and warehouse suppliers. Fuel oil, gas and electricity are the major fuels used, and the natural gas supply is backed up in some locations by propane stored in-plant and in reserve storage.

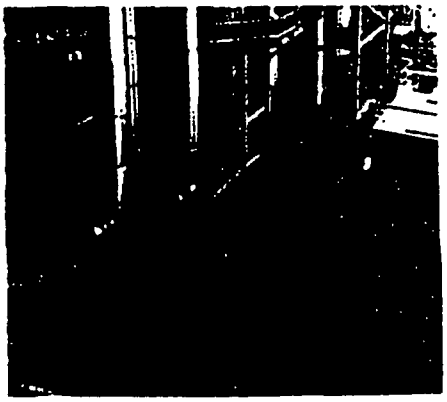
Competitive and Seasonal Conditions

There is significant competition in each of Engineered Metal Products business lines. Certain of the Group's products generally sell at premium prices, and Koppers strong market position is based upon demonstrated excellence in design, performance, technical support and other specific factors.

Principal products and services are distributed mainly through the Group's sales force, augmented in some lines by agents and distributors. Most business lines are not affected by seasonal fluctuations, although activity in certain environmental control equipment lines is affected by winter slowdown in commercial and manufacturing plant construction.

Working capital amounts include repair parts inventories required for field service activities, as well as inventory parts kept on hand for standard machines in order to meet competitive delivery schedules. Also, in certain lines such as electrostatic precipitators and sound control products, working capital amounts include retainages that are receivable upon satisfactory performance of the installation.





Diesel piston rings are used in industrial and truck markets, where performance requires high quality.

Thermomechanical pulping systems are a major advance in processing pulp for paper.