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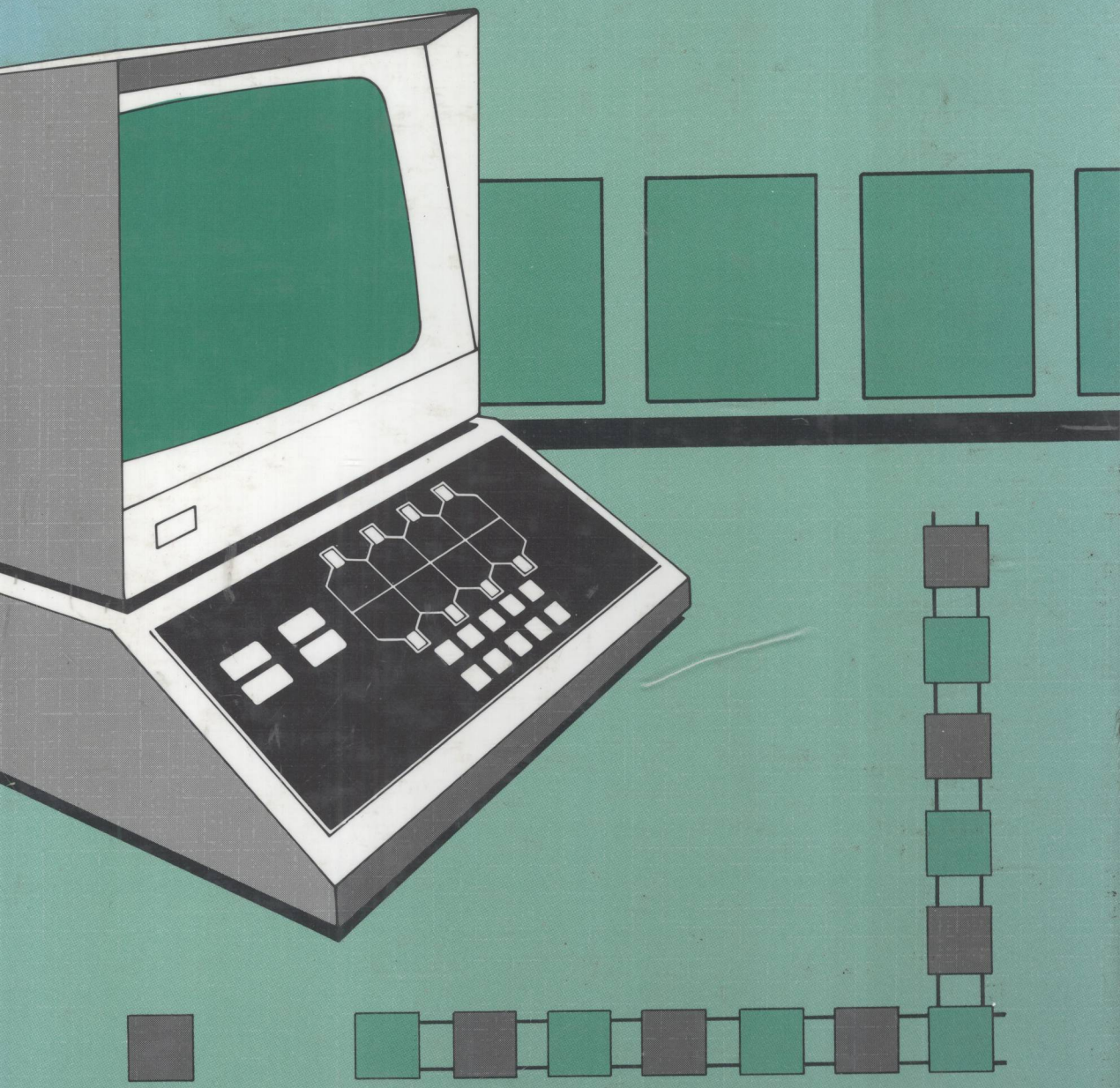

A to Z in Advanced Manufacturing

Automation ENCYCLOPEDIA

A to Z in Advanced Manufacturing

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A to Z in Advanced Manufacturing

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This book is dedicated to my wife Rochelle, whose support made this endeavor successful.

ABOUT THE AUTHOR

Glenn A. Graham is Manager of CIM Consulting Services for the northeast region of Coopers & Lybrand's manufacturing consulting practice. He is a certified manufacturing engineer (CMfgE) and holds an S.B. in Mechanical Engineering from the Massachusetts Institute of Technology. Mr. Graham is a member of the SME Electronics Manufacturing Technical Council and Steering Committee. His technical qualifications include the disciplines of mechanical engineering, electrical engineering, and computer science. He has held positions in manufacturing automation development and implementation and has led software and hardware product development projects, as well. Mr. Graham currently specializes in providing consulting services in computer-integrated manufacturing (CIM), as well as computer-aided engineering (CAE), networking, systems design, and computer-based productivity tools. The author is continually developing new areas of applications for computers and integrated tools.

ABOUT COOPERS & LYBRAND

Coopers & Lybrand is one of the leading international public accounting and management consulting firms. A matrix of professionals in 95 offices throughout the country serve the Management Consulting Services (MCS) division. Major consulting services in MCS include management information systems, business and organizational planning, operations improvement, material control, and financial analysis. Our management consulting services practice is strongly committed to industry specialization, and includes programs in financial service, manufacturing, health care, engineering and construction, oil and gas, retail and utilities industries, as well as federal, state and local governments, and education. Coopers & Lybrand also has three functional areas under which consulting services can be grouped: Business Planning, Information Systems, and Productivity.

The Coopers & Lybrand approach to consulting includes three phases: diagnosis, development, and implementation. The diagnostic phase includes a thorough analysis of the problem as well as identification of alternative solutions. During the second phase a specific solution is fully developed. The final phase is more than just implementation; it also consists of those activities that help to make sure the solution is both accepted and effective.

The Manufacturing Consulting practice in the northeast region offers a full range of consulting services to help manufacturers understand and apply the new and emerging technologies. The integrated approach to manufacturing consulting is unique among consulting and accounting firms involved in this specialty. Some of the areas of specialization include Planning and Control Systems (MRPII), Just In Time (JIT), Total Quality Control (TQC), Cost Management, and Computer Integrated Manufacturing (CIM). Over 30 manufacturing professionals with a wide variety of backgrounds and extensive experience in the manufactuirng environment work from this region.

ABOUT SME

The Society of Manufacturing Engineers is an international technical society dedicated to advancing scientific knowledge in the field of manufacturing. SME has more than 77,000 members in 70 countries and serves as a forum for engineers and managers to share ideas, information and accomplishments.

Technology is constantly evolving. To be successful, today's engineers must keep pace with the torrent of information that appears each day. To meet this need, SME provides many opportunities in continuing education for its members.

This continuing education is provided through:

- Educational programs including seminars, clinics, programmed learning courses, as well as videotapes.
- Conferences and expositions which enable engineers and managers to examine the latest manufacturing concepts and technology.
- SME publications which include *Manufacturing Engineering* magazine, the *Journal of Manufacturing Systems*, the *Technical Digest*, and a wide range of books including the *Tool and Manufacturing Engineers Handbook*.
- Monthly meetings through five associations and their more than 300 chapters and 165 student chapters worldwide to provide a forum for membership participation and involvement.
- The SME Manufacturing Engineering Certification Institute formally recognizes manufacturing engineers and technologists for their technical expertise and knowledge acquired through experience and education.

As a leader among professional societies, SME assesses industry trends, then interprets and disseminates the information. SME members have discovered that their membership broadens their knowledge and experience throughout their careers. The Society of Manufacturing Engineers is truly industry's partner in productivity.

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American National Standard for Machine Tools, Power Press Brakes—Safety Requirements for Construction, Care, and Use B11.3-1982

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A

A Axis. A axis is an angle defining rotary motion of a machine tool member or slide around the X axis, such that a right-handed screw advanced in the positive A direction would be advanced in the positive X direction.

Also see: Axis, X Axis.

ABC Inventory Control. ABC inventory control analysis was derived from Vilfredo Pareto a nineteenth century engineer who was the first to document the Management Principle of Materiality which serve as a basis of ABC inventory control. The Management Principle of Materiality notes that controlling the relatively vital few will result in controlling the whole.

The ABC classification of the inventory items are in a decreasing order of annual dollar volume. Additional criteria may be used such as unit cost, scarcity of material, lead time, storage requirements, cost of stock out, and design volatility.

Class A inventory items are those items which have the highest annual dollar volume and receive the most attention for planning, inventory control including cycle counting, forecast evaluation and lead time reduction. Class B inventory items receive the same control activities with, but less frequency. Class C inventory items include the low-value items where the controls may include larger order quantities, floor stock and a planning rule of safety stock.

Also see: Inventory Control.

Abort. Abort is the stopping of a computer at an irregular point in its program, usually before the normal completion of the executing sequence. This occurrence may be due to human or machine initiation. Usually aborting a program requires restarting from a beginning entry point.

In data transmission, a function invoked by a primary or secondary sending station causing the recipient to discard (or ignore) all bit sequences transmitted by the sender following the preceding flag sequence.

When operating a computer from a keyboard terminal, the typical method of aborting a program is to press the Escape (Esc) key or to press Control-C (Ctrl-C) or to press the Break key (Break), or sometimes the Control-Break keys (Ctrl-Break). With some of these types of aborting, such as pressing the Break key, the terminal session may have to be reinstituted or the machine may have to be rebooted, instead of just restarting the program.

Also see: Application Program, Computers, Programming.

Abrasive. Abrasive is the material from which the grains ina grinding wheel are made—usually crystalline aluminum oxide, silicon carbide, or diamond.

Abrasive Flow Machining. Abrasive flow machining is a process for finishing holes, inaccessible areas or restricted passages by clamping the part in a fixture, then extruding semisolid abrasive media through the passage. Often, multiple parts are loaded into a single fixture and finished simultaneously.