

Plastics and Polymer Processing Automation

The Plastics and Rubber Institute

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PLASTICS AND POLYMER PROCESSING AUTOMATION

Edited by

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Foreword

This book is an authoritative, up-to-date discussion of advanced manufacturing technology – automation – in plastics and polymer processing, based on a conference sponsored by The Plastics and Rubber Institute. An amalgamation of the leading expertise from industry and academia is presented, which covers both technology and business strategy. The various chapters illustrate how to achieve increased competitiveness by properly planning the use of new technology.

In addition to ten chapters on the technology in general, specialized sections on computer aided/computer integrated manufacture and competitive manufacturing systems in continuous and discontinuous processes are also included. This book should be very helpful to those continually interested in cutting costs.

The information in the book is from *Polymer Processing: Automation '86*, prepared by The Plastics and Rubber Institute, based on The Plastic and Rubber Institute's second international conference on competitive manufacturing systems, held at Sandown Park, Surrey, UK, June 1986.

The table of contents is organized in such a way as to serve as a subject index and provides easy access to the information contained in the book.

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Part I

General

SUMMARY OF WELCOMING ADDRESS

V. John Osola*

Manufacturing has an important place in the economies of all the developed countries - both in terms of employment and in its contribution to wealth-generation. The rapid growth in the world-wide application of microelectronics is providing new opportunities for products, production processes, and manufacturing control systems. It is also increasing competitive pressures.

Some three years ago the United Kingdom National Economic Development Office commissioned a study of the impact of Advanced Manufacturing Technology on a number of companies in the United Kingdom, and the findings were published, and widely discussed in the engineering industry during the second half of last year. The study evaluated the AMT experience in those U.K. engineering companies which had decided to upgrade their production processes, and then to examine effects of a comprehensive AMT programme on some typical performance factors. The report also reviewed the costs and benefits of introducing AMT and gave guidance on planning and implementation

The conclusions from this work were that :

- 1 successful investment in AMT provides substantial financial and organisational benefits to companies of all sizes;
- 2 the investment can be largely self-financing, with only a short-term requirement for external funding, provided that it is carried out in a number of well-considered and well-managed stages.

* Chairman, NEDO AMS Group Committee

The Advanced Manufacturing Systems Committee of NEDO believes that although the study was confined to batch engineering manufacturing operations, the principles and findings are generally applicable to a wide range of other manufacturing industries, and they will in due course be seeking firm data on this question.

For the engineering companies which were surveyed, the following key results are revealed :

- 1 Materials costs reduced by 13 - 15%
- 2 Total production costs reduced by 14 - 27%
- 3 Operating profits doubled or trebled
- 4 Reductions in staff numbers, floor space, and general overheads contribute to falls in unit costs and cost of sales.

Apart from profitability, other notable changes occur in fixed and working capital, cash flow, and in a shift in capital employed towards a higher fixed content. New technology allows working capital to be significantly reduced.

Success does not automatically follow investment in advanced manufacturing technology, however. Careful medium term planning is essential, coupled with detailed consultation with employees and trade unions. Investment in an employee training and re-training programme, at the same time as the capital investment programme takes place, is usually essential. Implementation in a number of discrete stages is advisable, achieving the full improvement and results from each stage before proceeding to the next. Discussions with engineering companies have suggested that there are about a dozen key steps involved in successful introduction of AMT and it is likely that similar steps will apply equally to other manufacturing companies in the process industries; the 12 key steps are :

- 1 A critical examination of the company's competitive performance
- 2 The establishment of a new manufacturing plan covering a 3 - 5 year period
- 3 The appointment of suitably qualified manufacturing management
- 4 Detailed manufacturing planning based on proven technology and phased in several manageable stages
- 5 Consultation with employees and trade unions
- 6 A detailed review of available skills within the company and the development of re-training programmes
- 7 The completion of full financial appraisal of the investment and its likely returns
- 8 The planning of stage I in fine detail