MICRO-ASSEMBLY TECHNOLOGIES
AND APPLICATIONS
IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

• The IFIP World Computer Congress, held every second year;
• Open conferences;
• Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly. National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.
MICRO-ASSEMBLY TECHNOLOGIES AND APPLICATIONS

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Preface

Micro-assembly is a key enabling technology for cost effective manufacture of new generations of complex micro products. It is also a critical technology for retaining industrial capabilities in high labour cost areas such as Europe since up to 80% of the production cost in some industries is attributed directly to assembly processes. With the continuous trend for product miniaturisation, the scientific and technological developments in micro-assembly are expected to have a significant long-term economic, demographic and social impact.

A distinctive feature of the process is that surface forces are often dominant over gravity forces, which determines a number of specific technical challenges. Critical areas which are currently being addressed include development of assembly systems with high positional accuracy, micro gripping methods that take into account the adhesive surface forces, high precision micro-feeding techniques and micro-joining processes.

Micro-assembly has developed rapidly over the last few years and all the predictions are that it will remain a critical technology for high value products in a number of key sectors such as healthcare, communications, defence and aerospace. The key challenge is to match the significant technological developments with a new generation of micro products that will establish firmly micro-assembly as a core manufacturing process.

The book includes contributions by leading experts in the field of micro-assembly presented at the 4th International Precision Assembly Seminar (IPAS’2008) held from 10 to 13 February 2008 in Chamonix, France. The seminar has established itself as a premier international forum for reporting and discussing research results and technical developments and charting new trends in micro assembly. The published works have been grouped into 4 parts. Part 1 is dedicated to micro-product design with specific emphasis on design for micro-assembly (DFμA) methods and solutions. Part 2 is focused on micro-assembly processes and includes contributions in process modelling, high precision packaging and assembly techniques and specific examples of micro-assembly applications. Part 3 describes the latest developments in micro-gripping, micro-feeding and micro-metrology. Part 4 provides an overview of the latest developments in the design of micro-assembly production systems with specific emphasis on reconfigurable modular micro-assembly equipment solutions.

The seminar is sponsored by the International Federation of Information Processing (IFIP) WG5.5, the International Academy of Production Research (CIRP) and the European Factory Automation Committee (EFAC). The seminar is supported by a number of ongoing research initiatives and projects including the European sub-technology platform in Micro and Nano Manufacturing MINAM, the UK
EPSRC Grand Challenge Project 3D-Mintegration, The EU funded coordinated action Micro-Sapient and the EU funded integrated project EUPASS.

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