

FP6 Contract: *NMP2-CT-2006-026622*

Project Acronym: HYDROMEL

Project Title: Hybrid Ultra Precision Manufacturing Process Based on
Positional- and Self-assembly for Complex Micro-Products

Instrument: Integrated Project.

Thematic Priority: Nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices.

Executive summary YEAR 2

Date: 14/11/2008

HYDROMEL in month 24

The HYDROMEL project reached mid-term: month 24. All subprojects (SPs) but SP7 were active in the reporting period. The focus until now was the development of robotics (SP2) and self-assembly (SP3) technologies. The combination of both (SP4) and integration (SP5) started. Demonstrator systems (SP1/SP7) have been consolidated. Quality control (SP6) is ongoing as well as monitoring (SP1), External links (SP8) and management (SP9).

Development of technological building blocks

The output of HYDROMEL build a technology platform with the key elements *robotics, self-assembly* and *hybrid integration*. At mid-term **important results have been achieved**. In robotics the development of integrated *macro-micro-kinematics* as manipulators and the development of dedicated tools such as *3D vision, microgrippers, micro force sensors* can be pointed out. In self-assembly, which is more fundamental research oriented, technologies have been developed that allow mechanical and chemical *functionalization of surfaces* and allow *self-assembly of nano-components*. The *combination of robotics and self-assembly* with focus either on top-down or bottom-up-approach has been applied for selected systems such as functionalized grippers and cell-sorting device.

Path towards integrated technology and demonstrations

The technology and its integration are demonstrated in **sub-systems in the various SPs** and in **special demonstrators**. Up to mid-term the demonstrators have been consolidated. A redefinition has taken place for two systems (demonstrator 1 “MEMS assembly” and partially 4 “Nanowires”), another demonstrator undergoes a critical technical review (demonstrator 2 “RFID tags”). Integration for the demonstrator 3 and 5 “Cell manipulation” and “Inspection” is well under way.

Accompanying Measures

Effort has been undertaken to **promote the project** inside the consortium (internal training sessions) and outside (preparation of the advisory board, workshops, publications and presentations). Those activities will be enforced to ensure exploitation and dissemination of project results.

Project Organization and Coordination

Consortium: Between month 13 and 24 a consolidation of the consortium has taken place. The company *MPS* has been replaced by *FemtoTools* and thus the scope of the mechanical demonstrator 1 has changed from ball bearing assembly to assembly of a MEMS force-feedback gripper. The withdrawal of *ALCHIMER* could be compensated inside the consortium. After *PROFACTOR* has taken over *ARC* and their project obligations, also this partner will leave the consortium. The corresponding changes will be described in the implementation plan of the upcoming project phase. It is not intended to introduce an external partner as substitution.

Coordinator: The coordinator changed from Helmut Knapp to Alexander Steinecker (both CSEM). Helmut Knapp is still involved in the project as deputy of the coordinator and as technical advisor.

Reporting: In order to improve communication between partners an extra reporting interval has been introduced: Between periodic activity reports (full year) and intermediate reports



(full year + semi year) another compact reporting on activities has been introduced. Thus a formal 3-monthly feedback between partners is guaranteed.