



## Eindhoven University of Technology recommend CI Microbalances

The Chemical Process Intensification group in the department of Chemical Engineering and Chemistry at Eindhoven University of Technology has constructed two TGA systems using microbalance components from CI Precision. The group's research topic is integration of reaction and separation, and in particular the group is working on membrane reactors, chemical looping systems and sorption enhanced reactions.

Dr. Eng. Fausto Gallucci, Associate Professor, writes:

One CI Microbalance has been used continuously for the last 4-5 years by master students, Erasmus students, PhD students and Post Docs. The second one is a new balance we are assembling in a custom made high pressure TGA system. The selection of this second balance is based on the very good experience with the first one which has been used in gas/solids reactions and solid sorption systems.



As we integrate reaction and separation, the reaction kinetics and the sorption kinetics are of primary importance to be able to design the reactor. For this reason, most of the studies we perform are on gas/solids reaction kinetics up to 1200°C, multi-cycles stability tests, sorption kinetics etc.

We generally use up to 100 mg of samples. We use different particle sizes especially to assess the presence of internal mass transfer limitations. The lower particle size used so far is in the order of 40 micron, the bigger size in the order of 0.5-1 cm

Time length of an experiment depends on the test, for stability tests we have from 20-50 hrs, for cyclic stability tests we perform up to 200-300 cycles of 30 minutes each. A typical experimental campaign takes about one week.

We have a custom made gas feeding system, through which we are able to feed mixtures of 7 gases plus vapours. In general we also feed steam to the system. We use our own data-log software which exports the data in text files for further analysis with Excel or MATLAB.



On being asked why the group chooses to work with CI's microbalances rather than others on the market, Dr Gallucci responded:

***“The stability is very high compared with the other balances we have. The precision is also very high, and most importantly very good reproducibility of the results. The cost to replace an old balance was also very affordable.”***

Regarding technical support from CI Precision, he says:

***“We are very happy with the support from CI. They have helped us when having some issues with the balance. They also helped a lot while we were designing the high pressure system.”***

Asked whether he would recommend CI Microbalances to others, he replied,

***“Absolutely yes. The stability of the balance is very good. The precision is also very good and the cost is low.”***

### About TU/e

Chemical Engineering and Chemistry is one of the nine departments of Eindhoven University of Technology (TU/e) in the Netherlands. It was established in 1957, shortly after the university was founded. The department aspires to be an academic institution for education and research in chemical science and engineering of the highest international standard. The aim is to generate and to develop technology and scientific knowledge relevant for the long-term needs of society.

### About CI Precision

CI Precision has over 50 years' experience as a world leader in microbalance technology. The versatile microbalance systems are supplied in kit form to allow researchers to make considerable savings when constructing specialist analytical equipment.

For more information about CI Microbalances, thermogravimetric kits and accessories from CI Precision, or to discuss your specific application, please telephone **+44 (0) 1722 424100**, or e-mail [sales@ciprecision.com](mailto:sales@ciprecision.com)

