

Weighing accurately as a function of temperature

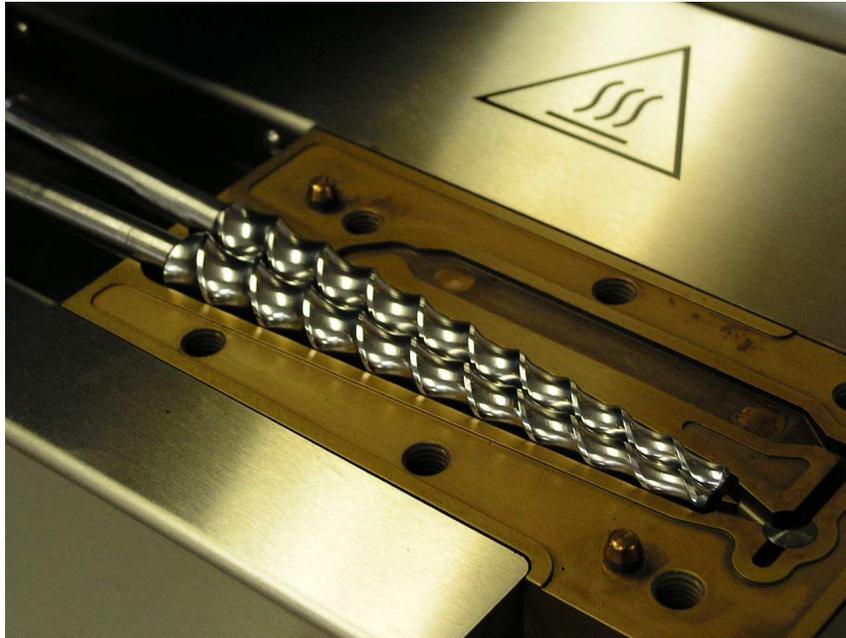
How do materials that are used for certain products behave? Do they satisfy under all circumstances, at all possible temperatures? And how are the properties of those materials being influenced by the converting process? Those kind of questions can be answered by the analytical instruments from Anatech.

"We are experts in measuring properties of materials, while simultaneously heating or cooling is applied." Archi Leenaers of Anatech in Sittard says. Six years ago he bought Anatech from its founder, who started this business because he was dissatisfied with the instruments he regularly used in his function at DSM. For more than twenty years now, Anatech has been developing and manufacturing instruments for laboratories that are active in fundamental and applied scientific research, as well as for those operating in quality control during production processes.

Development of new instruments is important; nine out of the twentyfour employees at Anatech are active in that field. They mainly develop Differential Scanning Calorimeters (DSC), that measure the heat flow in e.g. a melt, and instruments for Thermal Gravimetric Analysis (TGA). Latter is a very accurate balance in a furnace that can measure weight changes during heating, with an accuracy of 0.00001%. The volatiles that evaporate at certain temperatures during the measurement reveal the composition of the sample. Anatech also came up with the idea of patented gripper fingers for robots, using memory metal, that can offer 50 samples to the instrument alternatively.

"We supply the users through large instrument makers. That co-operation also gave rise to this project." Leenaers points to a very accurate and sophisticated TGA from Mettler, developed in the '60s. "The current market for this instrument is limited, so no successor has ever been developed. On the other hand, this fine instrument is still used worldwide. After consulting Mettler, we came with an upgrade kit to replace its oldfashioned electronics with an embedded system, so the instrument can now be connected to a computer and our user software enables the user to communicate with it."

Apart from these analytical instruments, Anatech also manufactures lab scale polymer converting apparatus. Small extruders produce under real life circumstances small amounts of plastic granulates. Plastic contains all kind of additives (flame retardants, plasticizers, colorants and so on) and determining the optimal composition is essential for every application. A normal extruder needs about 10 kg of polymer per recipee, while this mini extruder needs less than 10 grams.



*The polymer powder is mixed with additives
by rotating the screws whilst being heated simultaneously.*

Leenaers: "To determine the optimal recipe for a plastic in a certain application, often 100 variations in composition need to be tested before the optimal composition is established. When the polymer (or an additive) is scarce, this can be very expensive. Moreover, our mini extruder determines during processing the viscosity of the melt, indicating the converting properties of the plastic in real life." A small injection molding machine can be used subsequently to manufacture test specimen to perform mechanical testing like tensile strength. "Chemical companies regain the investment in such types of apparatus very easily."

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