


Report			
MCD Elektronik GmbH Hoheneichstr. 52 – 75217 Birkenfeld Tel. +49-7231 78405-0 – Fax: +49-7231 78405-10 Managing Director: Bruno Hörter	Release Date: 19.04.2018	Page 1 von 9	
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No More Cold Coffee


Test and Measurement Specialist Examines Coffee Quality

What makes a good coffee? Equipped with the latest in-house technology, MCD marketing manager Verena Hörter and her team undertook a journey of discovering the secret of perfect, freshly brewed coffee. We spoke to Verena Hörter to make her reveal the secret of perfect coffee and MCD's test- and measurement technology.

Interviewer: Ms. Hörter, how does one get the idea of determine the best coffee with the help of measurement technology?

Verena Hörter: Before I am starting a dispute amongst experts or a shit-storm amongst baristi, I should point out that the tests should be considered with humour and the winking of an eye. The idea was born shortly before the productronica fair in 2015. Instead of only serving normal machine coffee and presenting our systems we thought: Why not demonstrate to visitors the big range of applications as well as how exact our measurement technology really works? Our „hobby-barista“ Gergely Boross, Chief Representative of MCD Hungary, especially brought coffee beans from his favourite roaster from Budapest. We had „Valle Verde“ (Guatemala), „Matahara“ (Ethiopia) and „Gachatha“ (Kenya) coffee – always made from freshly light-roasted beans. Gergely Boross especially designed and developed our test software, the MCD Coffee Toolmonitor, for this unusual test case. Even if the tests concerning the perfect coffee should not be taken entirely seriously, the procedure and the implemented technology are definitely serious.


Interviewer: Can you give a brief description of the test and the used devices?

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Verena Hörter: The test setup examined five different criteria: temperature, optimal ratio of water to beans, duration of brewing- and throughput time, color, which means the design and the look and last but not least the extraction/strength-value of the coffee.

The correct temperature was monitored via a special kettle with programmable water temperature levels and a hold function. To measure the ideal composition of the ratio, we used digital scales. The prepared station for the measurement of the ground beans was a special coffee scale with integrated app as well as a USB connection. Our coffee enthusiast and employee Gergely Boross provided the API (Application Programming Interface) from the developer of this special scale, so that we could visualize the curves in the MCD Toolmonitor precisely. A second, high-precision scale was also attached to the Toolmonitor via a RS232 connection. The „Chemex Carafe“, which we chose as traditional preparation method, was placed on this scale. Here, the ground beans and the already pre-heated water mixed together. We monitored the time factor with an integrated stopwatch. The look and the brewing behavior could be determined with the help of a photo-video-camera. We really examined every little detail according to our slogan „Sharp senses for perfection“.

In the beginning, we boiled the water with a programmable kettle to 94-96 degrees Celsius. After that, we grounded the beans with the predefined grinding degree via a hand mill, placed them on the filter and put them through with the optimally calculated brewing time. A drop of the already produced coffee was added with the help of a pipette to analyze it inside the refractometer to examine it for the perfect TDS-value. TDS stand for Total Dissolved Solids and measures the amount of dissolved solids in the coffee. These values were classified in a strength matrix, which was also included in our Toolmonitor.

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If the value lies in the middle quadrant, the quality is optimal, if it lies outside it is too weak or too strong (see picture 5, Strength Matrix). In the end, and this was more fun than a really executable test, we checked the coffee cup optically. All this was monitored and supplied via Gergely Boross's MCD Coffee Toolmonitor.


Interviewer: How can we imagine this?

Verena Hörter: The MCD TestManager with its associated Toolmonitors is a software platform with a graphical user interface, which can be freely designed and adapted to customers' needs. We used this fact on our coffee tests as well. All measurement and test results were clearly displayed and merged in a defined screen (see picture 3, „Coffe Toolmonitor“ Screen). Configurations made once can be saved in project files and loaded again if needed. With the help of an integrated script engine all measurements and settings can be processed automatically. The Toolmonitors can be integrated in a large number of applications, i.e. TestManager CE, LabView as well as Microsoft Visual Studio and the Microsoft Office programs.

Interviewer: Now you have to let us know how your test results look like or rather how the perfect coffee is composed.

Verena Hörter: Our measurements and the tastings, which were responsible for countless sleepless nights, were unable to reach an unanimous agreement. In spite of all precision of the technical tests and measurements, the individual taste of each test person was the decisive factor. It was remarkable that, based on the recommendation of our barista, 80 % of our visitors tasted the coffee without additives like milk and sugar.

Regardless of the individual taste, the measurement results displayed that the extraction/strength value (TDS) should lie in the middle quadrant, so that it is neither too bitter nor too weak. According to our hobby barista


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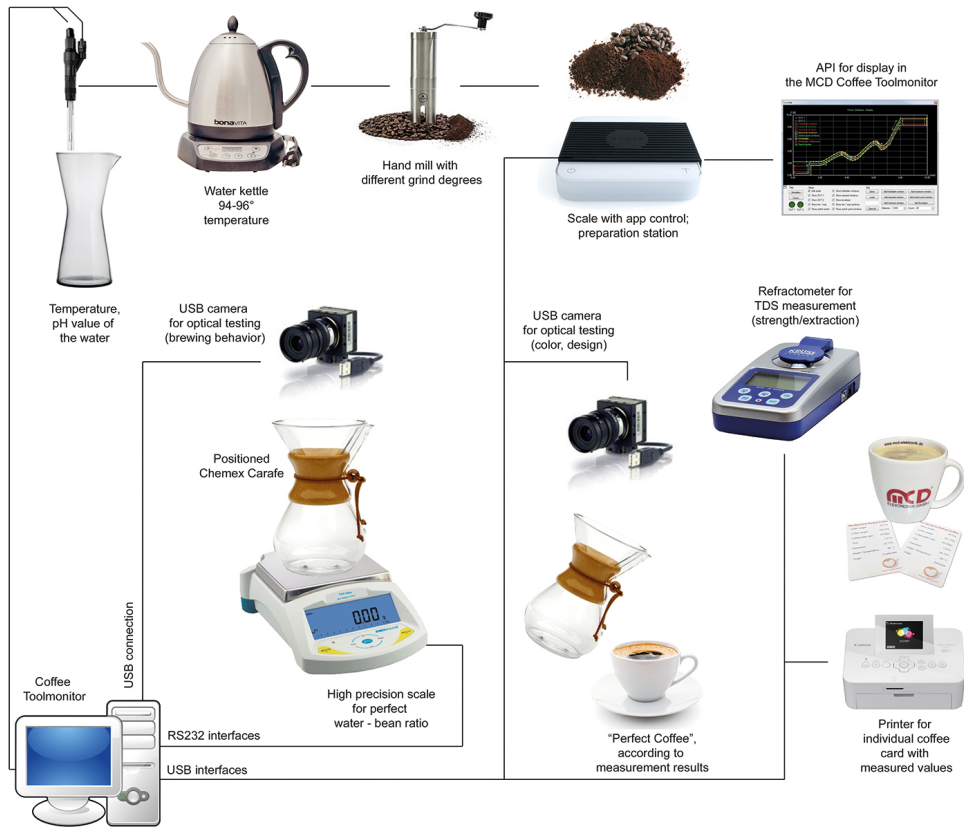
Gergely Boross, the ideal water temperature should be between 94-96° Celsius. In combination with the right brewing time, the ideal TDS value as well as the exact water/bean ratio, we found the perfect coffee according to measurement standards, for us.

Pictures:




Picture 1: The MCD „messBar“ (measurement bar) on the productronica booth was a success and a magnet for visitors.

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Picture 2: The test setup of the MCD Coffee Tests.

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Picture 3: The specially programmed MCD Coffee Toolmonitor documented and monitored the tests.

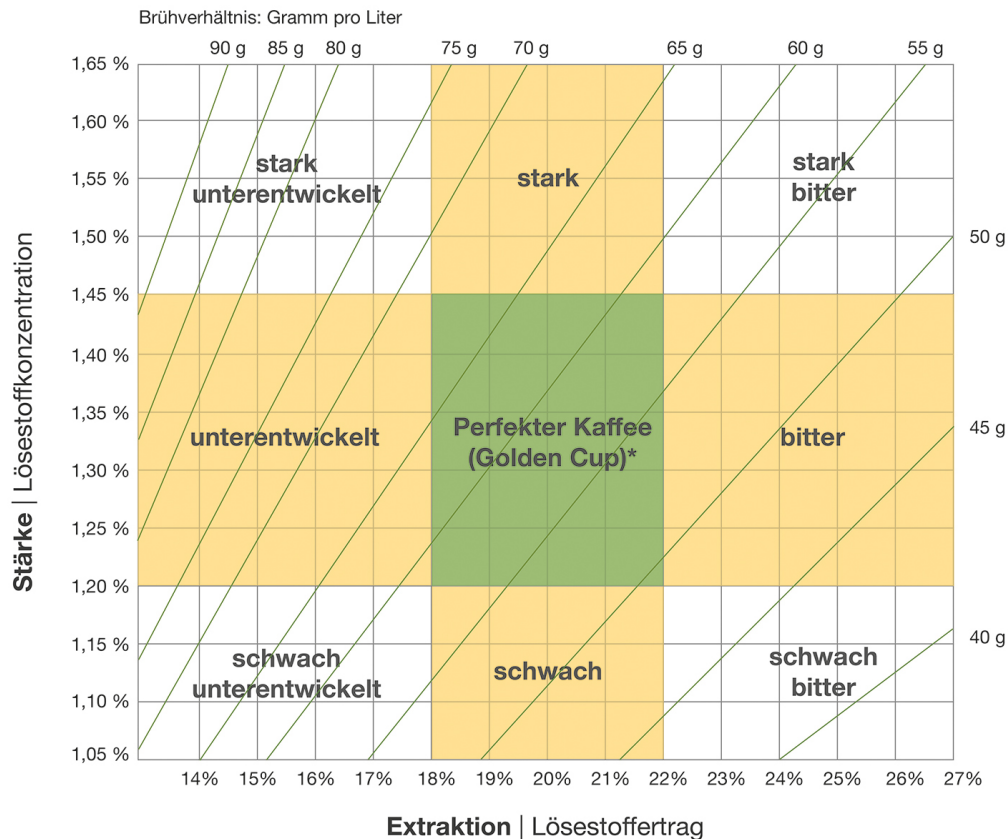
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Picture 4: MCD Elektronik printed an individual card with details of the brewed coffee.

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Brühzeit-Kontroll-Diagramm




Picture 5: The strength extraction matrix defines the quality of the coffee, analyzing the extracted, dissolved solids.

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About MCD Elektronik GmbH:

MCD Elektronik GmbH was founded in 1983 and currently employs 80 people. The owner-managed company is headquartered in Birkenfeld, near Pforzheim, Germany. MCD Elektronik is active in Germany, Hungary, and China, and delivers to 48 countries around the world.

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MCD Elektronik GmbH manufactures measurement and test systems for electronic production for their customers, who include OEMs and their suppliers in the automotive sector, companies in machine and systems design, medical technology, energy-electronics, quality technology, sensor manufacturing, and aerospace. The company relies on innovative customer-specific complete solutions - developed and realized by a team of highly qualified specialists.