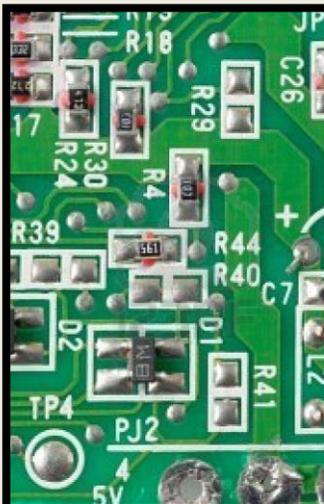
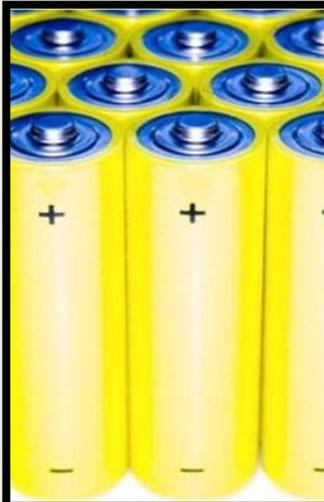


Acorn Chek

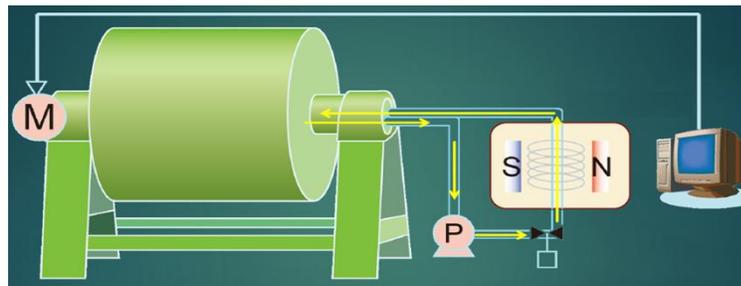


Process Monitoring Particle Analyzer



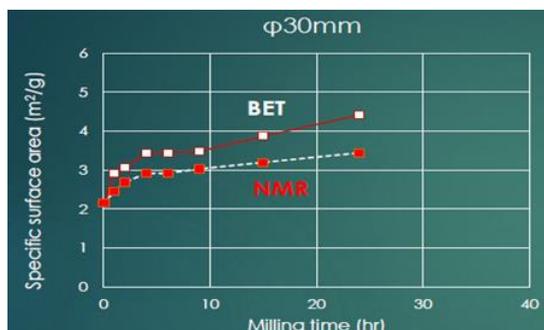
Introducing the Acorn Chek

Our customers have recognized that the best place to control quality is in manufacturing. As a result, we redesigned the Acorn Area to meet the needs of manufacturing and created the **Acorn Chek**. Now, for the first time, our measurements of wetted surface area are available online. The figure below illustrates how the Acorn Chek can be used to control milling conditions:



The **Chek** is ideally suited to measure concentrated dispersions used in ceramics for MLCCs, battery slurries, abrasives, etc. Since the **Chek** uses magnetic resonance rather than light, it has some compelling advantages. No dilution is required to perform a measurement, and obscuration effects associated with light based measurements are eliminated. Since the **Chek** measures wetted surface area, it is uniquely sensitive to the smallest particles because they represent the largest percentage of the total area. Even though the **Chek** does not measure size distribution directly, surface area measurements are more sensitive to the true size distribution than direct size distribution measurements based on light because small particles scatter light with weak intensity, making them difficult to detect using light.

Wetted surface area measurements can also be correlated with dry powder methods such as BET, as shown in the figure below for a ceramic slurry as a function of milling time:





Enclosure Vent



Emergency Stop



Push to connect fittings

Enclosure:

The **Chek** is packaged in a NEMA 4X, IP 65 enclosure 372 x 487 x 199 mm, that weighs about 14 kg. The standard enclosure is fabricated from an ABS/Polycarbonate alloy with a transparent polycarbonate cover. A separate aluminum panel encloses the operating parts of the **Chek**. The **Chek** enclosure internally is divided into an upper vented chamber which houses the electronics and a lower thermostatted chamber which houses the magnets, yoke assembly and measuring cassette. The enclosure is designed to be mounted on a wall or vertical panel using 4 wall mounting brackets (included). Both portions of the enclosure can be connected to an external inert gas supply for explosion proof environments.

Power:

The Acorn **Chek** uses universal power supplies which automatically adjust to incoming power from 100-240 VAC, 50/60 Hz. The system requires 250 watts of power. An emergency switch is located at the top of the enclosure to terminate all power in the event the power must be cut from the device.

Flow Control:

Sample flows into the measurement chamber by pressure from the process stream and then flow is stopped for a short duration to perform the measurement. New material is pumped into the measurement cell and the process is repeated.

The flow of sample to the **Chek** is controlled by software controlled electronic solenoid pinch valves. These valves work well with concentrated particulate dispersions and preserve the integrity of the sample. Pinch valves compress flexible 5mm tubing which can be replaced with each production run. Wetted parts in the **Chek** are user replaceable FEP tubing. Other materials are available on request. Measurements are performed using XiGo Nanotools patented flow through assembly which features a 4mm ID, 5mm OD FEP (Fluorinated ethylene propylene) polymer sample tubing. Connection for the measurement cell are 5mm O.D. push to connect fittings.



Industrial touch panel PC



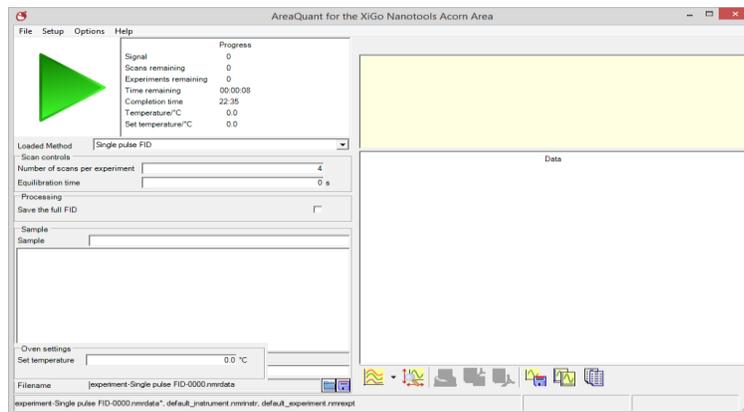
Flow Control Software



Cat 5 (RJ45) Interface

Measurement Control:

The **Chek** is controlled locally by a 307mm x 307mm fanless touch screen industrial PC with Intel (i7/i5/i3) processor. The sample flow to the Acorn **Chek** is regulated by programmable interface. A Windows 10 operating system (Other operating systems such as Windows 7 & 8 are available on request). The PC also includes an Cat 5 (RJ45) network interface to acquire data or control the **Chek** remotely. Tabular and or results may displayed on a remote PC. The native data file format is XML which is compatible with MS Excel or LIMS systems.

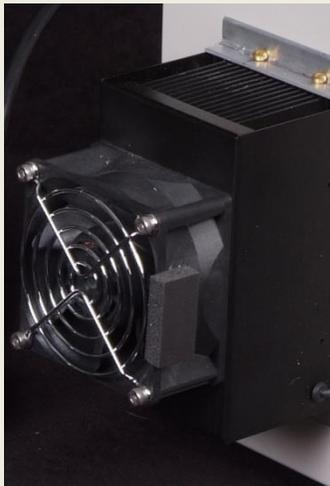


XiGo Nanotools AreaQuant software performs measurements of wetted surface area or relaxation time as a function of time. Measurement intervals and other data acquisition parameters are programmable.

The Acorn **Chek** can also be controlled by an external programmable logic controller (PLC) from a variety of manufacturers such as Mitsubishi, Siemens, Allen Bradley, etc.

PC Specifications:

- Windows 10
- 12.1" LCD TFT Display (800x600 Resolution)
- Intel 4th Gen Core i3-4010U CPU, Fanless
- 64 GB SSD Drive
- Onboard 4GB DDR3 RAM
- Resistive Touch Screen
- Full Flush IP65 Front Bezel



Thermoelectric
Temperature controller



Pinch Valve

Temperature Control:

The **Chek** includes a 144 Watt thermoelectric regulated air-air circulation system that will maintain the temperature in the measuring region to 0.1°C from 10-50°C. Sample temperature is regulated in close proximity to the sample and displayed in real time on the built in industrial PC. The thermoelectric control system features internal and external long life (50,000 MTBF) low noise (<55 dB) fans to keep the temperature of the sample and magnets stable over time despite changes in the temperature of your production facility.

Cleaning & Servicing:

The sample wetted parts are all user replaceable with push to connect fittings. The pinch valve tubing is also user replaceable. One of the big advantages of this valving mechanism is that the valve itself has no wetted parts, so replacing the tubing is sufficient. The valve control software can control up to 8 different electronically controlled solenoids using the optional valve control pcb. This enables to user to clean the wetted parts by flushing the system with solvent.

The flow cell and all the important PCBs, power supplies, etc. can be replaced by the user in a few minutes. All hardware components are configured by software, no hardware adjustments are required.

Other Applications:

While milling and grinding operations are one application, there are many other uses for this measuring method in manufacturing. For example, the Acorn Area measurements have been used successfully to follow particle formation processes such as precipitation.

Please contact your XiGo representative or visit www.xigonanotools.com or www.xigonano.jp to discuss your application in detail, or to arrange a demonstration of the **Chek**.



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