Last updated November 30, 22

MICRO USER AGREEMENT

SCANNING

Test scans: A single reduced cost ($40 flat fee) pilot scan will be provided to the individual(s) or entity who contracted the scanning (i.e.,"the primary user") to demonstrate proof-of-concept or to be included in grant proposals. Sample scans will be used to optimize scan parameters according to the object properties and analytical needs. Students interested in collecting pilot data should contact MICRO personnel about options for further reduced pilot scan rates.

Scanning fees: Fees are charged for scanning on an hourly basis and depend on affiliation with the University of Arkansas as well as scanning needs. These fees include scan preparation time (i.e., mounting the specimen and setting scan parameters), active beam time on the machine, dataset reconstruction time, and time it takes to upload or transfer the data to the primary user. Time will be charged in full 15-minute increments (with all increments rounded up to the nearest 15 minutes). External university/ non-profit users that are paying with federal funds will be charged the internal university rates.

The fee schedule is as follows (effective Dec 1, 2022):

	Internal University	**External University/ Non-Profit+**	**Industry**
Drop-Off	$85/hour	$125/hour	$200/hour
Unassisted*	$60/hour Batch rate: $2,500	$100/hour Batch rate: $4,500	n/a

*Offered to high-volume trained operators only. See the section on User Training below.

+ External/non-profit users paying with federal funds will be charged internal university rates

Batch scanning: If an unassisted individual user (or multiple users related to the same project) conducts scanning for at least 50 hours within any 90 day (~3 month) period (starting from the first day of scanning), then the first 50 hours will be billed at a "batch rate". Internal and federally funded external users will pay a flat fee of $2,500; external users will pay a flat rate of $4,500. This results in a net benefit to users by providing a $10/hr discount on those 50 hours of scanning. Any hours over 50 up to 100 will be billed at the normal hourly rate; once users reach 100 hours, they will again be billed the "batch rate" (which will be determined by their internal/external and funding status). Any necessary training time will be charged at the assisted rate and separate from the batch rate. Industry users are not eligible for the batch rate.

Additional fees: We welcome frozen specimens for scanning and have a chest freezer on site, though these specimens are often more challenging to define the appropriate scanning parameters for and are more likely to

move during scanning (particularly long scans). Because of this extra handling time, frozen specimens may be charged a 40% mark-up (to account for additional scans where the first scan fails).

Users are also welcome to ship specimens to MICRO for scanning and/or to request that we ship specimens back to you after scanning. Please note we return all specimens to the primary user; MICRO will not ship specimens to addresses or personnel other than the primary user. If the user would like us to return-ship specimens then a return shipping label will need to be provided by the user and users will be charged an additional $15 fee to cover time required to package and schedule specimens for shipping.

Scheduling: Scanning services are offered on a first-come-first-serve basis and will depend on the equipment configuration (i.e., which target head is on the machine at the time) and your scanning needs. MICRO will make every effort to scan objects in a timely manner, but scan turn-around times may vary. Final scheduling decisions are at the discretion of MICRO personnel and the director of CAST.

Permissions: It is the responsibility of the primary user to acquire explicit permissions from any relevant museum, collaborator(s), and/or principal investigators involved in the research for which scanning or analysis is being conducted. Students wishing to use the equipment for research or classwork must provide a letter of support from their advisor and/or class instructor, and letters must identify an appropriate source of funding for the scanning to be conducted.

Your specimen: As researchers ourselves, we appreciate the delicate, rare, and invaluable nature of research specimens. We treat all specimens with care, and we may elect not to scan material if it appears too delicate to handle or if packaging has been damaged prior to arriving at MICRO. In some instances, we may request that the primary user be on site during scanning to handle particularly sensitive or fragile objects. Though we strive to ensure the integrity of all materials scanned at MICRO, MICRO is not responsible for any damage that may inadvertently occur during scanning. During scanning, specimens will be stored in a locked cabinet in the MICRO lab. It is the responsibility of the primary user to notify MICRO personnel if objects require any special storage arrangements. We can scan preserved soft-tissue specimens, though we require that these specimens be packaged for scanning by the user (in consultation with MICRO personnel). Please note we do not have onsite facilities for draining fluid-preserved specimens (e.g., ethanol or formalin preserved soft-tissue specimens).

RECONSTRUCTION, DATA PROCESSING, STORAGE, AND RETENTION

Reconstruction: All microCT data must be reconstructed following scanning but prior to analysis. We are capable of reconstructing CT data using a series of optimization steps. Our default approach to data reconstruction is to utilize the scanning and reconstruction settings for each specimen that contrasts multiple structures clearly while minimizing noise and potential visualization artifacts. We also recognize that users may wish to have datasets that are reconstructed to specific parameters with ease of automated segmentation methods in mind (e.g., in Avizo, VG Studio Max, etc.), and we will honor such requests. Reconstruction will be charged at the same hourly rate as scanning.

Your specimen data: Please include an empty, USB-capable hard drive or thumb drive with any specimens shipped to MICRO. Hard drives should be clearly labeled with the name and contact information of the primary contact. The hard drive must be compatible with Windows (e.g., FAT32, NTFS, or exFAT) and have sufficient storage space for all scan data. Data will be returned on the included hard drive with the specimen. Visitors to MICRO should bring their own portable storage device(s) along with their specimen(s). We strongly recommend SSD hard drives rather than HDD hard drives as SSD are capable of considerably faster data transfer rates than HDD. MICRO is not responsible for data integrity on non-MICRO hardware.

MICRO makes no claim to the data of your specimen(s). Ownership of the data resides with the primary user. We will not share, publish, or otherwise distribute your data outside of MICRO to anyone but you without express, written permission.

Data output: Our standard data output type is a 16-bit TIFF image stack paired with one or more metadata files. TIFF is a lossless image format, which can result in datasets that are several gigabytes in volume. TIFF stacks are not inherently spatial, but the *.XtekCT metadata file included with your datasets contains the voxel dimension in X, Y, and Z orientations for input into 3D modeling software. We are also equipped to output *.VGL volume files that open directly into VG Studio Max.

Storage lifetime: MICRO will store all primary scan data for at least 90 days. Within this period, reconstructed image stacks or VGL files may be deleted to allocate additional space, but they can be reconstituted from the original scan data. Unless a written request has been received and approved by MICRO, all scan data will be deleted following this 90-day period. *.XtekCT metadata files may be retained as templates upon request for users planning for extended periods of CT scanning. Data may be deleted with a written request from the primary user at any time.

Data backup: Unforeseen issues with data management or physical infrastructure can occur from time to time. MICRO systems are backed up regularly to allow for full restoration from backups as needed.

Data security: We secure our systems with antivirus protections to prevent malware from spreading. It is our policy to move data onto users 'portable hard drives but not to move files onto our systems. We regret any inconvenience this might cause.

Data sharing: Although we fully support data sharing initiatives, it is not the role of MICRO to upload scan data or their derivatives to online repositories**.** We strongly recommend that our users upload their datasets in a format, file size, and time commensurate with their research and publishing needs and the interests of their preferred data repository.

Image processing: At the request of users, MICRO can further assist with data processing and analysis, typically in the programs Avizo, VG Studio Max, and/or ImageJ. Image processing needs should be discussed in detail with MICRO personnel and will be billed depending upon analytical needs. Basic surface generation (i.e., single material) will be billed at a flat rate of $40/object. We anticipate that this will typically take less than one hour. More complex surface generation (i.e., multiple materials) or other types of analyses (e.g., porosity or density analyses) will be billed at an hourly rate of $65/hour.

Those users wishing to process their own data but lacking appropriate software may book time on MICRO computers (e.g., so that users may process their own data in Avizo) at a rate of $15/hour. As with scanning, image processing services and access to MICRO software is on a first-come first-serve basis and should be coordinated with MICRO personnel.

Documentation: We generate a digital "paper trail" for all inquiries, imaging requests, data reconstruction, analytical work, and data deletion to facilitate an efficient workflow. This information may be visible to the MICRO Scientific Advisory Board and relevant staff at the Center for Advanced Spatial Technologies. It is our policy not to distribute scans, contact information, or logistical details outside of the MICRO team unless a request is made in writing by the primary user.

TRAINED OPERATORS

User training: Only trained users (i.e., "operators") will be allowed to operate the microCT equipment unassisted by the MICRO technician. This will typically be limited to individuals who anticipate scanning a large number of specimens and who are affiliated with the University of Arkansas or are sponsored by MICRO/CAST personnel or researchers. MICRO reserves the right to determine who is eligible to become an operator.

Equipment operation: The microCT scanner was purchased with federal and state funds for the benefit of the education and research community. MICRO strives to keep all systems in peak operating condition, and requests that all users and operators do the same. In order to help us keep the equipment in working order, all operators must:

- Ensure that the external coolant system is activated before generating X-rays.
- Accurately log your usage time on the equipment and report any problems with the equipment immediately.
- Keep the MICRO lab and equipment clean. This includes removing any mounting material residue from the manipulator plate after usage.
- Not attempt to perform any maintenance operations (i.e., filament change) on the equipment. All maintenance should be handled by MICRO personnel only.
- Make sure that the equipment is appropriately powered down (i.e., X-rays are off) and the MICRO lab is locked upon leaving.

Scanning fees: Operators performing their own scans (typically after hours or on weekends) will be required to block off time on the equipment and will be billed for all beam-on time, plus an additional fifteen minutes for set-up/reconstruction time per scan. Users will not be charged for time related to machine/equipment failure or auto-condition/machine warm-up time. If an operator does not use all of their scanning time and MICRO is unable to make use of that time, operators may be charged for the time originally scheduled. It is the responsibility of the operator to keep track of their time using the equipment, though scan times will also be verified via time stamps on scan data and equipment use logs.

Equipment damage or loss: Operators will be held responsible for any damage to the lab or equipment (outside of normal maintenance issues) that occurs during their use of the MICRO facilities. The University of Arkansas Building/Property insurance policy covers damage or loss to on-campus equipment, with a deductible of $100,000. Users and/or their departments are liable for any damage or loss up to the cost of this deductible (see the University of Arkansas Insurance Information for detailed policy on Building/Property Policy effective 7/01/11 – 7/01/12).

Consumables: When appropriate, MICRO appreciates when intensive users budget for hardware consumables (e.g., filaments), which they may be likely to use up at an above-average rate.

External university operators: External university operators must complete the "MicroCT Equipment External Operator Use Agreement" before permission can be granted to operate the microCT equipment.

CONFIDENTIALITY

It is our goal to treat all data generated at MICRO as confidentially as possible. However, it is possible that other users or operators visiting the MICRO lab may see file names or scanning materials. We also find it useful to discuss general examples of scanned objects with potential users so that they understand the breadth of scanning options and set-ups. If this is a concern, it is the responsibility of the user to clearly communicate this with MICRO personnel. MICRO will only use scan data or images (i.e., in presentations, promotional materials, or blogs) with express permission of the user.

ACKNOWLEDGEMENT

When possible, please acknowledge the MICRO facility and personnel in presentations and publications. For example, “MicroCT scans conducted for this research were performed at the University of Arkansas MicroCT Imaging Consortium for Research and Outreach (MICRO), which was originally funded as part of a National Science Foundation Major Research Instrumentation grant (BCS-1725925).”

PAYMENT FOR MICRO SERVICES

It is expected that MICRO users will pay all fees in a timely manner. Before scanning, users will be asked to identify a funding source and/or provide a billing address for all fees incurred during scanning and data processing. All external users must complete a W-9 form before scan data is provided. Internal University of Arkansas users must provide a grant worktag number (formerly cost center number) prior to scanning; external users will be invoiced at the conclusion of all scanning and/or analysis.

CONTACT INFORMATION

Please direct additional inquiries to micro@uark.edu with “MICRO Policies” in the subject line.