

# Zeiss Xradia Versa 620 Workflow - Staff Analysis

## Staff Analysis Only

The Zeiss Xradia Versa 620 XRM is currently available for staff analysis only. Below is step-by-step instructions on how to submit samples for scans and request training for data processing.

## Analysis Rate

- a minimum charge of \$200 (Academic) / \$600 (Industrial) for the first two hours
- \$50/hr (Academic) / \$150/hr (Industrial) beyond the initial 2 hours

Example costs:

- 1-hour scan: \$200 (Academic) / \$600 (Industrial)
- 2-hour scan: \$200 (Academic) / \$600 (Industrial)
- 3-hour scan: \$250 (Academic) / \$750 (Industrial)

## Sample Submission

1. Submit a [Sample](#) request on [LMACS](#).
2. Please include the following information in the request:
  - a. Describe the physical dimensions of your material (length, width and height, or diameter and thickness).
  - b. Describe the material type (i.e., life science, material research, additive manufacturing, semiconductor packaging) and composition.
  - c. Describe the analysis objectives (features size) and location of region of interest in detail (design maps or related image will be helpful).
  - d. If you are submitting similar type of samples that you have scanned previously, please indicate the previous request ID.
  - e. Please indicate if you only need 2D projection instead of 3D tomography.
3. Example submissions:
  - a. **Powder materials**
    - Particles contain mainly light elements (C, S, O, N)
    - Particle size is between 100-500 nm in diameter and has potential voids inside.
    - I am looking for the tomography of whole material structure (field-of-view: ~ 3 x 3 mm, minimum feature size ~ 10 nm).
  - b. **3D printed metal structures**
    - This additive manufacturing material contains mainly Fe and Ni as well as light element doping.
    - Overall dimension 5 x 5 x 10 mm.
    - I am interested in the overall structural morphology and potential voids (1-10 μm) in the material in the individual struts.
  - c. **Semiconductor package**
    - A lightning cable adaptor. The protective case are polymers. Chips and capacitors inside contain polymer, silicon and thin metal contacts.
    - Overall dimension 5 x 3 x 40 mm (see attached photo),
    - I am looking for the metal coils in the circled region.
  - d. **Note: If you have a package that you do not know the detailed design/ internal structure, our staff will schedule time to setup the preliminary scans with you to identify ROI.**





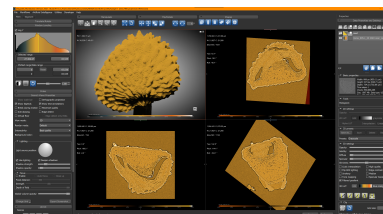
### Sample dimension

1. Although the system can accommodate large size samples, smaller sample size will help obtain higher quality results and reduce overall scan time. With smaller sample size, the detector and source can be brought closer to the sample/ROI, which will increase achievable resolution and X-ray intensity.
2. Sample need to be mounted on a holder, by glue, sticky tape, clamp. Please provide details if any caution is required when handling/mounting your samples.
3. Sample cannot change its morphology during the measurement (i.e., dehydration or moving in liquid/solution). This will fail reconstruction.
4. For samples with high aspect ratio (wide or tall), wide-mode or vertical-stitch is available.

Objective	Sample size (maximum*) (mm)	Maximum 3D FOV (mm)	Voxel size Bin 2 (m)
0.4X	6 - 50 (100*)	50	6 - 60
4X	2 - 20 (50*)	6	0.7 - 6
20X	0.5 - 4.0 (10*)	1.1	0.5 - 1.2
40X	0.3 - 2.0 (5*)	0.5	0.3 - 0.6

## Data Processing

1. The recommended data processing software for 3D analysis is **DragonFly** from [ORS](#).
2. The standard files that are provided to users are DrogaonFly session files (**.ORSSession**) that contain one or multiple reconstructions.
3. A workstation loaded with Dragonfly Pro software at nanoFAB common computer area (L2-112, CME Building) is available to registered nanoFAB users.
4. [Trial version](#) and free [non-commercial license](#) (for academic users) of DragonFly are available on ORS website to download and install on your own workstation. Minimum hardware requirement is available [here](#).
5. Basic software training of DragonFly by nanoFAB staff is available. Please submit a [Training request](#) on LMACS.
6. [Basic DragonFly SOP](#) is available here. Detailed [tutorials](#) on advanced processing (i.e. [interface](#), [manipulate panel](#), [interpolating features on ROIs](#)) are available on ORS website.



### File formats

1. There are also other files available: 2D projection files (.xrm), reconstructed raw files (.txm), projection dataset (.txrm) and recipe file (.rcp). Most of these files are Zeiss proprietary and need special versions of software to open.
2. If you only need 2D projection, we can convert Zeiss proprietary format (.xrm) files to other image formats.
3. We can also provide Zeiss proprietary formats (.xrm, .txm) if you have special needs. It can still be loaded in software like Fiji(ImageJ) with [plug-in](#), but with only limited functions. Please discuss your needs with us first.
4. The session file with a reconstruction typically has a size ~100 MB to 1GB depends on the volume of empty space that can be cropped. Reconstructed raw files (.txm) has a typical size 1.8GB for a single scan with binning 2 (standard). That means the PC will be handling 1000 layers of 1000 x 1000 pixel images the same time.