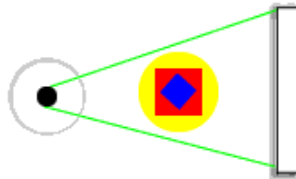


Rotate-Only CT

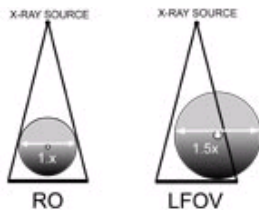
Rotate-only CT is sometimes referred to as third generation CT. It is the basic mode used by most industrial CT systems. It requires the scanned object to fit within the field-of-view of the detector and x-ray beam. The object is rotated one time per slice and is then repositioned vertically by the distance of the slice width. Most slices can be acquired in seconds using this scan mode. Of course the actual time depends upon the geometry of the particular scan, the material density of the object being scanned and the number of views acquired.



One disadvantage of rotate-only CT scans is the inherent creation of ring artifacts in the image. Rings occur when one or more detector channels produce a stronger signal than the surrounding ones. In a CT image, ring artifacts look like the ring segments seen in the cross section image of a tree. They can be particularly troublesome if the object being scanned is cylindrical, or if the region-of-interest or flaw being detected has radial qualities, because they can create a false impression of the object's characteristics.

Offset Rotate CT

BIR ACTIS™ CT systems offer a scan mode called “offset rotate” or “large field-of-view.” Offset rotate CT uses special algorithms to reconstruct an image of an object from less than a full 360° rotation. The object is positioned slightly outside the field-of-view of the detector as shown in the figure below. Offset Rotate Only (ORO or Asymmetric RO) mode positions the center of rotation away from the beam centerline but still within the fan beam. The object is rotated through 360 degrees. Rebinning is used to create the data missing in each view of the sinogram. This mode can be used to image objects up to 1.5X greater than the centered mode. In microfocus systems with variable magnification capability, ORO mode can be used to increase spatial resolution by putting nearly 1.9X more samples across a given FOV.



The advantage of this technique is that the system can image a part that is between 1.5 and 1.9 times larger than the field-of-view of the detector, depending on the magnification setting for the scan. Offset rotate also allows the object to be spread across more detector channels which improves resolution.