

# I-MAX TOUCH

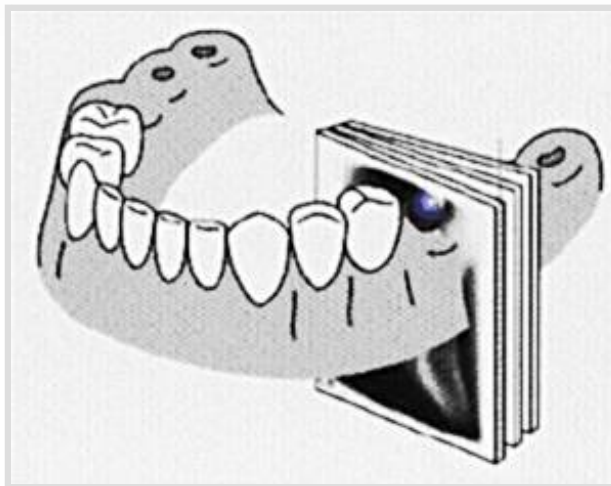
with digital tomographic function.

“The tomographic process creates sharpness out of blur”  
Pr. Fischgold



## Introduction :

Tomography: radiological technique for obtaining clear x-ray images of internal structures by focusing on a specific plane of the body to produce a cross-sectional image. It allows the examination of structures that are obscured by overlying organs and soft tissues.

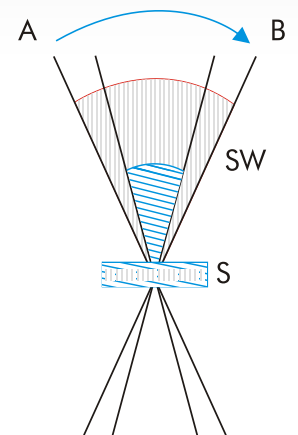
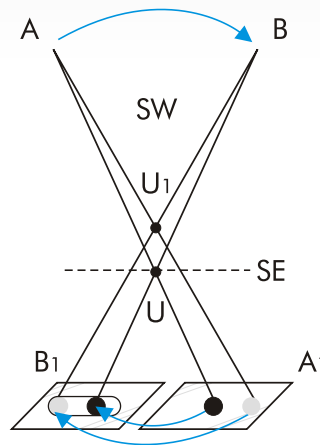
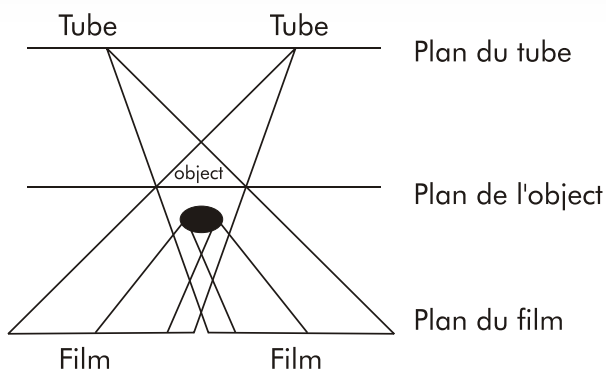


The tomogram is obtained by moving the source of x-rays in one direction and the receptor (film or digital sensor) in the opposite direction around the object in the focal plane. This sharpens the object in the rotation centre as it is always in the same place on the sensor, and blurs/hides the structures that are not in the focal plane as they are projected in different parts of the sensor during the movement.

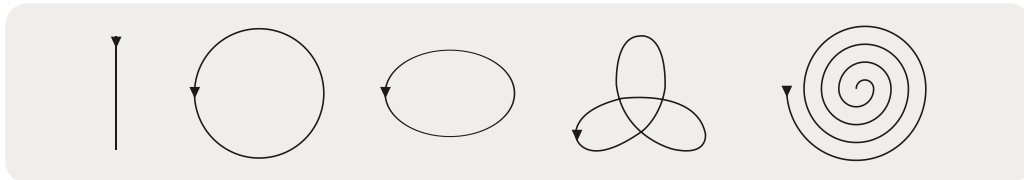
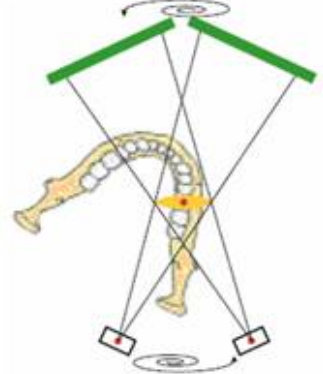
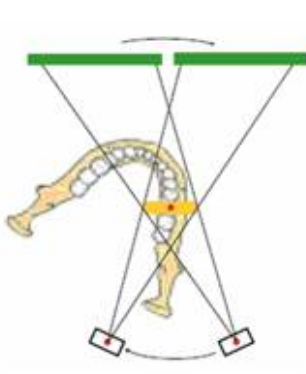
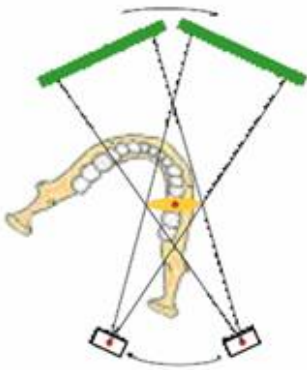
Objects that are situated before the slice are blurred and smaller, objects behind the slice are blurred and larger.

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with digital tomographic function.



The thickness of the slice has an influence on the image: a thin slice provides more details by better removing the objects outside the focal plane, but reduces the contrast. The thickness of the slice is determined by the angle of the slice; a wide angle (long trajectory) will give a finer slice. A zonography is a tomography with a slice thickness superior to 5mm.



## Linear tomography

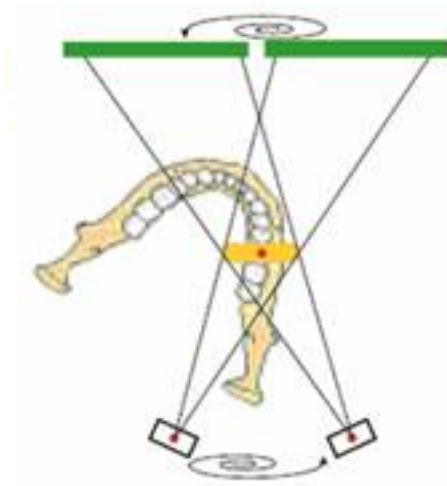
First technique: the x-ray generator and the sensor move synchronically around the object in the focal plane, but the sensor is kept perpendicular to the x-ray beam. This produces a straight image, but the resolution is optimal only in the middle of the image. The layer thickness is not uniform and has a lens shape.

True linear tomography: the x-ray generator and the sensor move synchronically around the object in the focal plane. The sensor is kept parallel to the focal plane all the time. This produces a straight image where the resolution and the thickness of the layer are constant all over the image. The blurring phenomenon is most effective in horizontal direction.

## Spiral tomography

Multidirectional tomography is a more complex technique where the sensor and the x-ray generator follow a circular or elliptical path. As long as both the generator and the sensor move synchronously, a clear image of object in the focal plane is obtained.

First technique: the x-ray generator and the sensor move synchronically along a spiral path, but the sensor is perpendicular to the x-ray beam. This produces a straight image, but the resolution is optimal only in the middle of the image and the layer thickness is



not uniform. The layer has a lens shape.

Best technique: the x-ray generator and the sensor move synchronically along a spiral path. The sensor is kept parallel to the focal plane at all times. The resolution and the thickness of the layer are constant all over the image. The blurring is effective in all directions.

The spiral tomography implies higher doses than for the other types.

## **Circular or elliptical tomography**

## **Hypocycloidal tomography**

## Uses

Tomography complements panoramic images and is used for implant operations and maxillofacial surgery. It allows for a more precise diagnosis of the area to be treated: determine the quantity and quality of the bone mass and the available space for an implant, localisation of root canals, position of the mandibular canal, localisation and orientation of included teeth, cysts and fractures. These details are not displayed correctly on panoramic images.

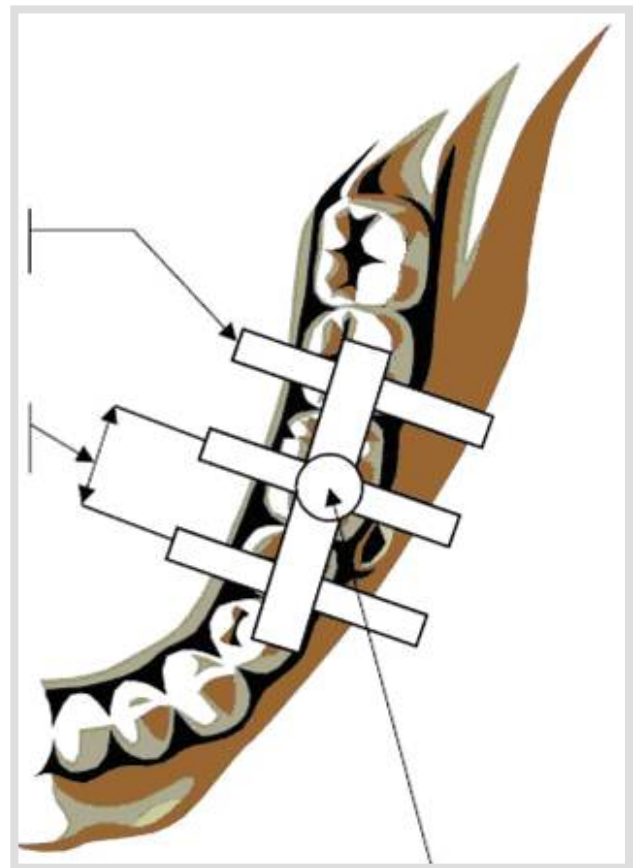
Used in the dental practice, tomography saves time by determining immediately the feasibility and scale of an implant treatment; the patient will only be sent to a radiologist when more detailed information is required, requiring specialised and costly 3D equipment.

Tomographic images require doses inferior to that for a panoramic image while 3D images need doses between 4 to 10 times higher (depending on the system).

The digital tomographic images can also be used as communication tools with the patient and allow the visualisation on the images of the planned implants.

Thickness of transversal slice:  
5mm (standard) to 7mm (molars)

Spacing between transversal slices: 5mm



Point of Interest

Technology: digital scanography providing an image equivalent to an analogue image obtained with linear tomography

Thickness of cross-section image: 5mm for incisors, canine and premolars; 7mm for molars  
Space between each of the 3 cross-section images: 5mm

## Image acquisition procedure

1. Select mandibular or maxillary area.
2. Select tooth number (1 to 8).
3. Position patient in the unit using the Implant chinrest (set for the mandibular or maxillary acquisition) and the median laser in the column. The median laser indicates the position of the middle transversal slice. The Implant chinrest allows for the rotation of the patient's head so that the laser coincides with the tooth to be X-rayed.
4. Acquire image.
5. Image display in the imaging software (image with 3 transversal slices).