

## Appendix

### *Explanation for the Different Magnitude of Errors in Bone Parameters Introduced by the Fiberglass Cast and the Plaster-of-Paris Cast*

The difference between the effect caused by a fiberglass cast and a plaster-of-Paris cast can be explained by the different material properties of the two casts. At the standard settings of the XtremeCT, the mean energy of the photons is 40 KeV. At this energy, calcium sulfate, the main component of plaster-of-Paris casts, has a linear x-ray attenuation coefficient ( $\mu$ ) of  $2.07 \text{ cm}^{-1}$ . The main component of a fiberglass cast is silica, which has a  $\mu$  of  $1.23 \text{ cm}^{-1}$  at  $40 \text{ KeV}^{20}$ . Due to its higher  $\mu$ , the plaster-of-Paris cast absorbs more lower-energy photons than fiberglass does, resulting in an underestimation of the bone density.