

References (database v3.1, 12.10.2016)

References for the low frequency dielectric conductivities listed in our material properties database. Values for tissues of which the properties are not available in the literature are substituted with values from other tissues. In these cases, the tissue used for the value is listed instead of a reference. The rationale for each individual substitution is provided in the Rationale for Tissue Substitutions.

Tissue	Low Frequency Conductivity
Air	Gabriel et al., 1996
Bile	Gabriel et al., 2009 Geddes and Baker, 1967
Blood	Gabriel et al., 2009 Geddes and Baker, 1967 Hahn et al., 1980 Mohapatra and Hill, 1975
Blood Plasma	Geddes and Baker, 1967
Blood Serum	Geddes and Baker, 1967
Blood Vessel Wall	Gabriel et al., 1996
Bone	Geddes and Baker, 1967
Bone (Cancellous)	Saha and Williams, 1989
	Sierpowska et al., 2003 Gabriel et al., 1996
Bone (Cortical) - Accross	Reddy and Saha, 1984
Bone (Cortical) - Along	Reddy and Saha, 1984
Bone (Cortical) - Around	Reddy and Saha, 1984
Bone Marrow (Red)	Sigman et al., 1936
Bone Marrow (Yellow)	Gabriel et al., 1996
Brain	Freygang and Landau, 1955 Geddes and Baker, 1967 Van Harreveld et al., 1963
Brain (Grey Matter)	Latikka et al., 2001 Raicu et al., 1998 Stoy et al., 1982 Van Harreveld et al., 1963 Gabriel et al., 1996
Brain (Grey Matter) - x along	Yedlin et al., 1974
Brain (Grey Matter) - y across	Yedlin et al., 1974
Brain (Grey Matter) - z Normal to Surface Axis	Yedlin et al., 1974
Brain (White Matter)	Latikka et al., 2001 Stoy et al., 1982 Gabriel et al., 1996

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Tissue	Low Frequency Conductivity
Brain (White Matter) - across fibers	Nicholson, 1965
Brain (White Matter) - along fibers	Nicholson, 1965
Breast Fat	Fat
Bronchi	Blood Vessel Wall
Bronchi lumen	Air
Cartilage	Binette et al., 2004
Cerebellum	Nicholson and Freeman, 1975
Cerebellum - x	Nicholson and Freeman, 1975
Cerebellum - y	Nicholson and Freeman, 1975
Cerebellum - z	Nicholson and Freeman, 1975
Cerebrospinal Fluid	Baumann et al., 1997
Cervix	Gabriel et al., 2009 Gabriel et al., 1996
Commissura Anterior	Brain (White Matter)
Commissura Posterior	Brain (White Matter)
Diaphragm	Muscle
Diaphragm - Parallel	Muscle - Parallel
Diaphragm - Perpendicular	Muscle - Perpendicular
Dorsal Column	Rank and BeMent, 1965
Dorsal Column - Across	Rank and BeMent, 1965
Dorsal Column - Along	Rank and BeMent, 1965
Ductus Deferens	Blood Vessel Wall
Dura	Tendon/Ligament
Epididymis	Ovary
Esophagus	Large Intestine
Esophagus Lumen	Air
Eye (Cornea)	Eye (Sclera)
Eye (Lens)	Pauly and Schwan, 1964
Eye (Sclera)	Gabriel et al., 1996
Eye (Vitreous Humor)	Pauly and Schwan, 1964
Eye Lens (Cortex)	Pauly and Schwan, 1964
Eye Lens (Nucleus)	Pauly and Schwan, 1964
Fat	Gabriel et al., 2009 Geddes and Baker, 1967 Hahn et al., 1980 Rush et al., 1963 Schwan and Kay, 1957 Gabriel et al., 1996
Fat (Average Infiltrated)	Fat
Fat (Not Infiltrated)	Fat
Gallbladder	Bladder Wall
Heart Lumen	Blood

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Tissue	Low Frequency Conductivity
Heart Muscle	Cinca et al., 1997 Ellenby et al., 1987 Fallert et al., 1993 Gabriel et al., 2009 Geddes and Baker, 1967 Hahn et al., 1980 Schwan and Kay, 1957 Smith et al., 1995 Tsai et al., 2002 Gabriel et al., 1996
Heart Muscle - Longitudial	Rush et al., 1963 Steendijk et al., 1994
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Hippocampus	Brain (Grey Matter)
Hypophysis	Thyroid Gland
Hypothalamus	Brain (Grey Matter)
Intervertebral Disc	Cartilage
Kidney	Hahn et al., 1980 Stoy et al., 1982 Gabriel et al., 1996
Kidney (Cortex)	Kidney
Kidney (Medulla)	Kidney
Large Intestine	Gabriel et al., 1996
Large Intestine Lumen	Muscle
Larynx	Cartilage
Liver	Gabriel et al., 2009 Geddes and Baker, 1967 Haemmerich et al., 2009 Hahn et al., 1980 Raicu et al., 1998 Rush et al., 1963 Schwan and Kay, 1957 Stoy et al., 1982
Lung	Geddes and Baker, 1967 Schwan and Kay, 1957
Lung (Deflated)	Gabriel et al., 2009 Hahn et al., 1980 Rush et al., 1963 Sanchez et al., 2013
Lung (Inflated)	Gabriel et al., 2009 Hahn et al., 1980 Rush et al., 1963 Sanchez et al., 2013
Lymph	
Lymphnode	Spleen
Mandible	Bone (Cortical)

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Tissue	Low Frequency Conductivity
Medulla Oblongata	Brain
Meniscus	Cartilage
Mucous Membrane	Muscle
Midbrain	Brain
Muscle	Hahn et al., 1980 Geddes and Baker, 1967 Hart and Dunfee., 1993 Stoy et al., 1982 Gabriel et al., 1996
Muscle - Parallel	Gabriel et al.,2009 Epstein and Foster, 1983 Geddes and Baker, 1967 Rush et al., 1963
Muscle - Perpendicular	Gabriel et al.,2009 Epstein and Foster, 1983 Geddes and Baker, 1967 Rush et al., 1963
Nerve	Brain (White Matter)
Ovary	Gabriel et al., 1996
Pancreas	Geddes and Baker, 1967
Patella	Bone (Cortical)
Penis	Blood Vessel Wall
Pharynx	Air
Pineal Body	Thyroid Gland
Placenta	Blood
Pons	Brain
Prostate	Halter et al., 2007
Salivary Gland	Prostate
SAT (Subcutaneous Fat)	Fat
Seminal vesicle	Prostate
Skin	Yamamoto and Yamamoto, 1976 Wake et al., 2016
Skull (Cancellous)	Gabriel et al.,2009
Skull (Cortical)	Gabriel et al.,2009
Small Intestine	Large Intestine
Small Intestine Lumen	Muscle
Spinal Cord	Dorsal Column
Spleen	Geddes and Baker, 1967 Hahn et al., 1980 Stoy et al., 1982 Gabriel et al., 1996
Stomach	Large Intestine
Stomach Lumen	Muscle
Tendon\Ligament	Gabriel et al., 1996
Testis	Ovary
Thalamus	Brain (Grey Matter)
Thymus	Spleen and Fat
Thyroid Gland	Gabriel et al., 1996
Tongue	Muscle

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Tissue	Low Frequency Conductivity
Tooth	Bone (Cortical)
Tooth (Dentine)	Bone (Cortical)
Tooth (Enamel)	Bone (Cortical)
Trachea Lumen	Air
Ureter\Urethra	Blood Vessel Wall
Urinary Bladder Wall	Keshtkar et al., 2006
Urine	Geddes and Baker, 1967
Uterus	Gabriel et al., 1996
Vagina	Large Intestine
Vertebrae	Bone (Cortical)
Water	Aldosky and Shamdeen, 2011

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