We consider the problem of finding $\boldsymbol{h}$ such that

$$\begin{cases} \nabla \times \big(\alpha(x)\nabla \times \boldsymbol{h}\big) = \boldsymbol{f} \qquad \text{and} \qquad \nabla \cdot \boldsymbol{h} = 0 \qquad \text{in } \Omega, \\ + \text{ tangential or normal boundary condition,} \end{cases} \tag{1}$$

where Ω is a bounded open multiply connected subset of $\mathbb{R}^3$, with a sufficiently smooth boundary, $\alpha \in L^\infty(\Omega)$ with $\alpha \geq \alpha_* > 0$, with other data in Lebesgue or Sobolev nonhilbertian spaces, satisfying adequate compatibility conditions. We prove existence and uniqueness of strong and weak solutions of these problems. These results will be useful to study an electromagnetic induction heating problem (work in progress with Chérif Amrouche).