

Preface

The microwave cavity resonators have been widely used in various equipment such as microwave ovens, radars, and satellite communications since past few decades. Recently, it is used in autoclave to achieve desire temperature distribution inside the autoclave. In order to maintain the appropriate temperature inside the autoclave/oven, it is necessary to estimate field distribution inside their cavity accurately.

In view of this, the EM analysis of field distribution inside some microwave cavities is presented in this book based on three-dimensional FDTD method. For the analysis, basically two types of closed microwave cavities are considered: (i) domestic rectangular microwave oven and (ii) industrial hybrid-cylindrical microwave autoclave. In these devices, the EM field distribution inside their cavity is estimated in xy -, yz -, and zx -plane. Further, the field distribution inside autoclave cavity is studied in the presence of cubic and cylindrical sample of composite material to show its capability to cure the aerospace components and materials.

This brief is organized as follows: Section 1 deals with the introduction about the work, and Sect. 2 describes the basic theory of FDTD method and its implementation. In Sect. 3, the EM field distribution inside domestic microwave oven is discussed. The modeling of curved microwave cavities including analysis of hybrid-autoclave is carried out in Sect. 4. Finally, Sect. 5 draws the conclusions of the work carried out in the book.

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