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   Nota di bibliografia Includes bibliographical references and index.

   Nota di contenuto   Preface -- Nomenclature -- Introduction to the Freezing Process --
                        Heat Transfer Coefficient and Physical Properties -- Introduction --
                        Analytical Solutions -- Approximate and Empirical Methods --
                        Numerical Methods -- Modeling Coupled Phenomena -- Conclusions
                        -- References -- Index.

   Sommario/riassunto   Freezing time and freezing heat load are the two most
                        important factors determining the economics of food freezers.
                        This Brief will review and describe the principal methods available for
                        their calculation. The methods can be classified into analytical
                        methods, which rely on making physical simplifications to be able to
                        derive exact solutions; empirical methods, which use regression
                        techniques to derive simplified equations from experimental data or
                        numerical calculations and numerical methods, which use
                        computational techniques such as finite elements analysis to solve the
                        complete set of equations describing the physical process. The Brief
                        will evaluate the methods against experimental data and develop
                        guidelines on the choice of method. Whatever technique is used, the
                        accuracy of the results depends crucially on the input parameters such
                        as the heat transfer coefficient and the product's thermal properties. In
                        addition, the estimation methods and data for these parameters will be
                        reviewed and their impacts on the calculations will be evaluated.

Freezing is often accompanied by mass transfer (moisture loss, solute absorption), super cooling and nucleation and may take place under high pressure conditions; therefore methods to take these phenomena into account will also be reviewed.