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Nota di contenuto	Cover; Contents; Preface; I. Joining Processes & Technologies; 1. Introduction to Joining: A Process and a Technology; 1.1 JOINING DEFINED; 1.2 REASONS FOR JOINING MATERIALS AND STRUCTURES; 1.3 CHALLENGES FOR JOINING MATERIALS; 1.4 CHALLENGES FOR JOINING STRUCTURES; 1.5 HOW JOINING IS CHANGING OR MUST CHANGE; 1.6 JOINING OPTIONS; 1.7 SOME KEY CONCEPTS RELATING TO JOINTS; 2. Mechanical Joining; 2.1 INTRODUCTION; 2.2 MECHANICAL JOINING AS AN ASSEMBLY PROCESS; 2.3 SOURCES AND TYPES OF JOINT LOADING; 2.4 SHEAR-LOADED FASTENED JOINTS; 2.5 TENSION-LOADED FASTENED JOINTS 2.6 FATIGUE LOADING OF FASTENED JOINTS2.7 OTHER FACTORS AFFECTING FASTENERS AND FASTENED JOINTS; 2.8 INTEGRALLY ATTACHED JOINTS; 3. Mechanical Fasteners, Integral Attachments, and Other Mechanical Joining Methods; 3.1 INTRODUCTION; 3.2 FASTENERS VERSUS INTEGRAL ATTACHMENTS OR INTERLOCKS; 3.3 THREADED FASTENERS; 3.4 UNTHREADED FASTENERS; 3.5 INTEGRAL MECHANICAL ATTACHMENTS; 3.6 OTHER MECHANICAL JOINING METHODS; 4. Adhesive Bonding and Cementing; 4.1 INTRODUCTION; 4.2 ADHESIVE

BONDING AS A JOINING PROCESS; 4.3 MECHANISMS OF ADHESION; 4.4 FAILURE IN ADHESIVE-BONDED JOINTS
4.5 KEY REQUIREMENTS FOR QUALITY ADHESIVE BONDING 4.6 ADHESIVE JOINT DESIGNS, DESIGN CRITERIA, AND ANALYSIS; 4.7 CEMENT AND MORTAR JOINING AND JOINTS; 5. Adhesives, Cements, Mortars, and the Bonding Process; 5.1 INTRODUCTION TO ADHESIVES, CEMENTS, MORTARS, AND THE BONDING PROCESS; 5.2 THE CONSTITUENTS OF ADHESIVES; 5.3 CLASSIFICATION SCHEMES FOR ADHESIVES; 5.4 IMPORTANT ORGANIC STRUCTURAL ADHESIVES; 5.5 IMPORTANT INORGANIC ADHESIVES, CEMENTS, AND MORTARS; 5.6 THE ADHESIVE BONDING PROCESS: STEPS AND EQUIPMENT; 5.7 ADHESIVE-BONDED JOINT PERFORMANCE
5.8 APPLICATIONS OF ADHESIVES, CEMENTS, AND MORTARS 6. Welding as a Joining Process; 6.1 INTRODUCTION TO THE PROCESS OF WELDING; 6.2 JOINING MATERIALS BY NATURAL PHYSICAL FORCES: WELDING; 6.3 CLASSIFICATION SCHEMES FOR WELDING PROCESSES; 6.4 FUSION WELDING PROCESSES; 6.5 NON-FUSION WELDING PROCESSES; 6.6 WELD JOINT DESIGN; 7. Brazing: A Subclassification of Welding; 7.1 INTRODUCTION TO THE PROCESS OF BRAZING; 7.2 BRAZING AS A SUBCLASSIFICATION OF WELDING; 7.3 PRINCIPLES OF BRAZE PROCESS OPERATION; 7.4 BRAZING PROCESSES; 7.5 BRAZING FILLER MATERIALS; 7.6 BRAZING FLUXES AND ATMOSPHERES
7.7 BRAZE JOINT DESIGN 8. Soldering: A Subset of Brazing; 8.1 INTRODUCTION TO THE PROCESS OF SOLDERING; 8.2 SOLDERING AS A JOINING PROCESS AND SUBSET OF BRAZING; 8.3 SOLDERING PROCESS CONSIDERATIONS; 8.4 SOLDERING PROCESSES; 8.5 SOLDERs AND BASIC SOLDER ALLOY METALLURGY; 8.6 FLUXES AND ATMOSPHERES FOR SOLDERING; 8.7 JOINT DESIGNS AND JOINT PROPERTIES FOR SOLDERING; 8.8 SOLDERABILITY TESTING; 9. The Basic Metallurgy of Welding, Brazing, and Soldering; 9.1 IMPORTANCE OF METALLURGY TO WELDING, BRAZING, AND SOLDERING; 9.2 WELDING THERMAL CYCLES AND HEAT FLOW AROUND WELDS
9.3 CONSIDERATIONS IN THE FUSION ZONE

Sommario/riassunto

Joining of Materials and Structures is the first and only complete and highly readable treatment of the options for joining conventional materials and the structures they comprise in conventional and unconventional ways, and for joining emerging materials and structures in novel ways. Joining by mechanical fasteners, integral designed-or formed-in features, adhesives, welding, brazing, soldering, thermal spraying, and hybrid processes are addressed as processes and technologies, as are issues associated with the joining of metals, ceramics (including cement and concrete) glass, plastics, and c
