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Nota di contenuto	A User's Guide to Vacuum Technology; Contents; ITS BASIS; 1. Vacuum Technology; 1.1 Units of Measurement; References; 2. Gas Properties; 2.1 Kinetic Picture of a Gas; 2.1.1 Velocity Distribution; 2.1.2 Energy Distribution; 2.1.3 Mean Free Path; 2.1.4 Particle Flux; 2.1.5 Monolayer Formation Time; 2.1.6 Pressure; 2.2 Gas Laws; 2.2.1 Boyle's Law; 2.2.2 Amonton's Law; 2.2.3 Charles' Law; 2.2.4 Dalton's Law; 2.2.5 Avogadro's Law; 2.2.6 Graham's Law; 2.3 Elementary Gas Transport Phenomena; 2.3.1 Viscosity; 2.3.2 Thermal Conductivity; 2.3.3 Diffusion; 2.3.4 Thermal Transpiration; References Problems3. Gas Flow; 3.1 Flow Regimes; 3.2 Throughput, Mass Flow, and Conductance; 3.3 Continuum Flow; 3.3.1 Orifices; 3.3.2 Long Round Tubes; 3.3.3 Short Round Tubes; 3.4 Molecular Flow; 3.4.1 Orifices; 3.4.2 Long Round Tubes; 3.4.3 Short Round Tubes; 3.4.4 Other Short Structure Solutions; Analytical Solutions; Monte Carlo Technique; 3.4.5 Combining Molecular Conductances; Parallel Conductances; Series Conductances; Exit and Entrance Effects; Series Calculations; 3.5 The Transition Region; 3.6 Models Spanning Several Pressure Regions; 3.7 Summary of Flow Regimes; References; Problems 4. Gas Release from Solids4.1 Vaporization; 4.2 Diffusion; 4.2.1

Reduction of Outdiffusion by Vacuum Baking; 4.3 Thermal Desorption; 4.3.1 Desorption Without Readsorption; Zero-Order Desorption; First-Order Desorption; Second-Order Desorption; 4.3.2 Desorption from Real Surfaces; Outgassing Measurements; Outgassing Models; Reduction of Outgassing by Baking; 4.4 Stimulated Desorption; 4.4.1 Electron-Stimulated Desorption; 4.4.2 Ion-Stimulated Desorption; 4.4.3 Stimulated Chemical Reactions; 4.4.4 Photodesorption; 4.5 Permeation; 4.5.1 Molecular Permeation; 4.5.2 Dissociative Permeation
4.5.3 Permeation and Outgassing Units4.6 Pressure Limits; References; Problems; MEASUREMENT; 5. Pressure Gauges; 5.1 Direct-Reading Gauges; 5.1.1 Diaphragm and Bourdon Gauges; 5.1.2 Capacitance Manometers; 5.2 Indirect-Reading Gauges; 5.2.1 Thermal Conductivity Gauges; Pirani Gauge; Thermocouple Gauge; Stability and Calibration; 5.2.2 Spinning Rotor Gauge; 5.2.3 Ionization Gauges; Hot Cathode Gauges; Hot Cathode Gauge Errors; Cold Cathode Gauge; Gauge Calibration; References; Problems; 6. Flow Meters; 6.1 Molar Flow, Mass Flow, and Throughput; 6.2 Rotameters and Chokes
6.3 Differential Pressure Techniques6.4 Thermal Mass Flow Meter Technique; 6.4.1 Mass Flow Meter; 6.4.2 Mass Flow Controller; 6.4.3 Mass Flow Meter Calibration; References; Problems; 7. Pumping Speed; 7.1 Pumping Speed; 7.2 Mechanical Pumps; 7.3 High Vacuum Pumps; 7.3.1 Measurement Techniques; Pump Dependence; Measurement of Water Vapor Pumping Speed; Pumping Speed at the Chamber; 7.3.2 Measurement Error; References; Problems; 8. Residual Gas Analyzers; 8.1 Instrument Description; 8.1.1 Ion Sources; Open Ion Sources; Closed Ion Sources; 8.1.2 Mass Filters; Magnetic Sector; RF Quadrupole Resolving Power

Sommario/riassunto

In the decade and a half since the publication of the Second Edition of A User?s Guide to Vacuum Technology there have been many important advances in the field, including spinning rotor gauges, dry mechanical pumps, magnetically levitated turbo pumps, and ultraclean system designs. These, along with improved cleaning and assembly techniques have made contamination-free manufacturing a reality. Designed to bridge the gap in both knowledge and training between designers and end users of vacuum equipment, the Third Edition offers a practical perspective on today?s vacuum technology. With