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Abstract: Nitinol's unique superelasticity and shape memory make it indispensable in modern medical devices. Yet turning a nickel-titanium ingot into a reliable, finished component demands careful control at every step. This talk provides a practical introduction to the nitinol manufacturing chain for engineers, designers, and others new to the material. Topics include melting and primary processing, hot and cold working to produce wire, tube, and sheet, and the role of heat treatment in setting transformation temperatures and mechanical behavior. We will then cover component-forming operations such as laser cutting, shape setting, and surface finishing and their influence on fatigue performance, corrosion resistance, and biocompatibility. Along the way, we highlight common pitfalls and the process–structure–property relationships that govern quality. Attendees will leave with a foundational understanding of how manufacturing decisions shape nitinol performance, and with the vocabulary to communicate effectively with suppliers and manufacturing partners.

Biography: Scott Robertson is the Vice President of Advanced Technology, leading R&D at Resonetics. He has over 20 years of research and engineering experience in the manufacturing, design, testing, and FDA regulatory submission of nitinol medical devices, working with companies from small start-ups to major medical device corporations. Dr. Robertson holds over 40 peer-reviewed publications, patents, and patent applications in the field. Before joining Resonetics in 2023, Scott was Vice President of Mechanical Engineering & Design at Adona Medical, a Shifamed-incubated company, where he developed a shape-memory adjustable interatrial shunt and remote pressure sensing system for heart failure. Previously, he led Medtronic's Structural Heart Valve Frame Design Team, overseeing sustaining engineering on legacy heart valves and development of next-generation devices. Scott co-founded Fathom Engineering, a medical device development consulting firm, after seven years at Nitinol Devices & Components (now Confluent Medical), where he served as General Manager of the Materials Business Unit and Engineering Fellow. He began his career at Cordis' Accelerated Medical Ventures group, working as a liaison between clinical key opinion leaders and engineers, gaining first-hand clinical and pre-clinical experience in cath and animal labs. Scott holds a Ph.D. and Master's degree in Materials Science & Engineering from the University of California, Berkeley, and a Bachelor's degree in Mechanical Engineering from the University of Texas at Austin. His doctoral thesis addressed the fatigue and fracture of nitinol in simulated biomechanical conditions. He has been an active member of the Shape Memory & Superelastic Technologies (SMST) society, teaching workshops, serving on its board, and co-chairing the 2014 conference. Dr. Robertson also has extensive failure analysis

experience from his early career at Exponent and has served as a court-designated engineering expert witness in numerous medical device litigations.