

Springer 2019

# Handbook of Materials for Wind Musical Instruments

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**Hardcover ISBN** 978-3-030-19174-0; **eBook ISBN** 978-3-030-19175-7;

**DOI**10.1007/978-3-030-19175-7; **Publisher Springer International Publishing 2019**

This book addresses key questions about the materials used for the wind instruments of classical symphony orchestra such as flutes, clarinets, saxophones, oboes, bassoons and pipe organs. The content of this book is structured into four parts. (21 chapters, 819 pages)

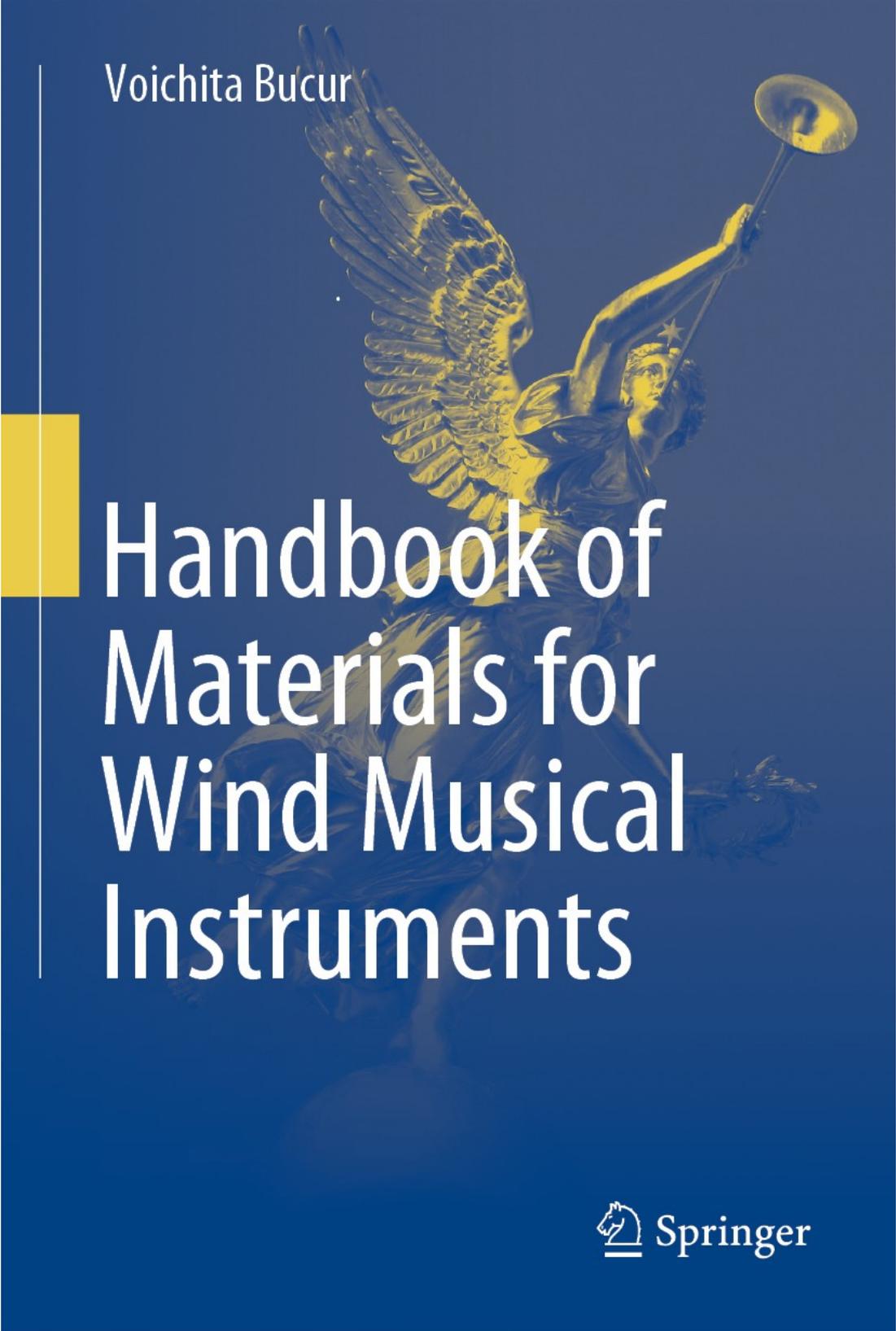
**Part 1-** Description of materials for wind instruments deals with wood species and materials for reeds used for making clarinet, oboe and bassoon- and, with metallic materials and alloys for - horn, trumpet, trombone, etc. Auxiliary materials associated with the manufacturing of wind instruments are felt, cork, leather and parchment.

**Part 2-** Basic acoustics of wind instruments, in which are presented succinctly, some pertinent aspects related to the physics of the resonant air column. An important aspect discussed is related to the effect of wall material on the vibration modes of the walls of wind instruments. The methods for measuring the acoustical properties of wind instruments are presented.

**Part 3-** Manufacturing of wind instruments, describes the technology used in manufacturing metallic tubes and pipes made of wood.

**Part 4 -** The durability and degradation of materials addresses data about methods for cleaning wind instruments, studies factors producing degradation of organ pipes, describes methods of conservation and restoration of brass instruments and of historical pipe organs. Finally, the properties of marble are described, being the only one nondegradable and sustainable material used for pipes for organs.

Voichita Bucur



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# Handbook of Materials for String Musical Instruments

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# Handbook of Materials for String Musical Instruments

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ISBN 978-3-319-32080-9

This book addresses core questions about the role of materials in general and of wood in particular in the construction of string instruments used in the modern symphony orchestra – violins, violas, cellos and basses. Further attention is given to materials for classical guitars, harps, harpsichords and pianos. While some of the approaches discussed are traditional, most of them depend upon new scientific approaches to the study of the structure of materials, such as for example wood cell structure, which is visible only using modern high resolution microscopic techniques. Many examples of modern and classical instruments are examined, together with the relevance of classical techniques for the treatment of wood. Composite materials, especially designed for soundboards could be a good substitute for some traditional wood species. The body and soundboard of the instrument are of major importance for their acoustical properties, but the study also examines traditional and new wood species used for items such as bows, the instrument neck, string pegs, etc. Wood species' properties for musical instruments and growth origins of woods used by great makers such as Antonio Stradivari are examined and compared with more recently grown woods available to current makers. The role of varnish in the appearance and acoustics of the final instrument is also discussed, since it has often been proposed as a 'secret ingredient' used by great makers. Aspects related to strings are commented. As well as discussing these subjects, with many illustrations from classical and contemporary instruments, the book gives attention to conservation and restoration of old instruments and the physical results of these techniques. There is also discussion of the current value of old instruments both for modern performances and as works of art having great monetary value. The book will be of interest and value to researchers, advanced students, music historians, and contemporary string instrument makers. Musicians in general, particularly those playing string instruments, will also find its revelations fascinating. It will also attract the attention of those using wood for a variety of other purposes, for its use in musical instruments uncovers many of its fundamental features.

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