The Book Series of China Materials Engineering Canon Won the 1st Chinese Government Award for Publishing

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The evaluation of the first Chinese Government Award for Publishing, organized by the General Administration of Press and Publication of People’s Republic of China, began in July, 2007. On February 21, 2008, the final result of the evaluation was officially released, which was based on local recommendations, expert assessment and public opinions. The 26-volume book series on China Materials Engineering Canon, compiled by the Chinese Mechanical Engineering Society (CMES) as the leading organizer and published by the Chemical Industry Press, was on the winners’ list.

As the highest prize in the field of press and publication in China, this Chinese Government Award for Publishing event attracted 1,214 books from nearly 450 publications. 120 of them were nominated and 60 of them have won the book award.


The China Materials Engineering Canon is the fruit of the combined efforts, knowledge and experience of more than 1,200 scholars from institutions and universities, including 39 academicians of Chinese Academy of Science (CAS) and Chinese Academy of Engineering (CAE). It took these scholars about five years to publish the book. Among the scholars, Academician Lu Yongxiang, President of CAS and President of CMES served as the Director of Editorial Board of the book, Professor Li Chenggong, consultation expert for the ‘973 Program’ panel under the Ministry of Science and Technology of the People’s Republic of China served as the Vice Director, and Academician Shi Changxu of CAE, a famous expert in materials, served as consultant. It not only overviews roundly the status quo, the latest progress and development trend of engineering materials in abroad, but also shows the R & D and industrialized achievements obtained in China. The publication of the book will provide the enterprises and readers with a very valuable core of information about appropriate materials selection, correct application of advanced materials and forming/processing technologies, improvement of the quality and performance of products, and reduction of operation cost, so as to enhance the competition force of products in the market. At the same time, it will be of great importance to push China’s materials science and materials forming/processing techniques for continuous innovation, and to promote the development and competitiveness of manufacturing industry of China in worldwide.


Great supports were received for the book publication from the Ministry of Science and Technology of the People’s Republic of China, Commission of Science, Technology and Industry for National Defense (COSTIND), National Natural Science Foundation of China, The China Association for Science and Technology (CAST), Chinese Academy of Sciences, Chinese Academy of Engineering and related colleges and universities, institutes as well as enterprises.

Volume 1 — The Fundamentals of Materials Engineering, written by Shi Changxu, Zhong Qunpeng and Li Chenggong, et al. (over 40 scholars in total), in 42 chapters and about 2.7 million words. It provides the outline of universal foundations for the rest volumes. It is involved in all types of materials and the fundamental knowledge about selection of materials for design of products, manufacturing processing/forming and failure analysis. The main content covers the fundamentals of materials science and engineering, basic principles of materials forming, numerical simulation and optimal methods for design, strength design and failure analysis of materials, etc. The organizations taking part in compiling the Volume 1 include the National Natural Science Foundation of China, Beijing Academy of Aviation Materials, Beijing University of Aeronautics and Astronautics (BUAA), Shanghai Jiaotong University, Chinese Materials Research Society, Nanjing University, Huazhong University of Science and Technology, Shandong University, Northeastern University, Tubular Goods Research Center of
Volumes 2 and 3 — Iron and Steel Materials Engineering, written by Gan Yong (Academician of CAE, President of Central Iron & Steel Research Institute, Vice President of Chinese Society for Metals), Tian Zhiling, Dong Han, Feng Di and Wang Xilinx et al., with about 5 million words. The organizations that participated in compiling the volumes 2 and 3 include the Central Iron & Steel Research Institute, University of Science and Technology Beijing (USTB), Tsinghua University, Shenyang Research Institute of Foundry, Beijing Beiyue Functional Materials Corporation (original name is Beijing Metallurgical Research Institute), etc.

Volumes 4 and 5 — Non–ferrous Materials Engineering, written by Guanzhou and Zu Tieyong et al. (68 scholars), in 14 chapters and about 4.7 million words. It covers aluminum and aluminum alloys, copper and copper alloys, nickel, cobalt and alloys, zinc, lead, tin and alloys, titanium and titanium alloys, tungsten, molybdenum and alloys, carbide alloys, tantalum, columbium and alloys, beryllium, zirconium, hafnium and alloys, noble metals and alloys, laminate non–ferrous metal matrix composites, and new non–ferrous metal materials.

Volumes 6 and 7 — Polymer Materials Engineering, written by Yang Boyun, Li Chenggong, Shi Likai, Ouyang Shixi and Shi Jianlin, et al., in 11 chapters and about 4 million words. It covers polymer and alloy, structural and functional performance, material properties, and processing technology. The organizations taking part in compiling the volumes 6 and 7 include the Sichuan University, Tianjin University, Dalian Polytechnic University, North University of China. It took these scholars about three years to complete these two volumes, which cover the conservatives, plastics engineering, organic fiber, rubber engineering, polymer adhesive, functional polymer materials and leather substance, etc.

Volumes 8 and 9 — Inorganic Non–Metallic Materials Engineering, written by Jiang Dongliang, Li Longtu, Ouyang Shixi and Shi Jianlin, et al., in 11 chapters and about 4 million words. It took these scholars about three years to finish. The organizations taking part in compiling the volumes 8 and 9 include the Shanghai Institute of Ceramics CAS, Tsinghua University, China Building Materials Academy, Jinlin University, Wuhan University of Science and Technology, Wuhan University of Technology, Sinosteel Corporation Luoyang Institute of Refractories Research Co., Ltd., Zhengzhou Research Institute for Abrasives & Grinding, Beijing Institute of Aeronautical Materials, etc. These two volumes cover structural ceramics (including ceramic matrix composites), functional ceramics, traditional ceramics, glass, crystal materials, inorganic coatings materials, refractory materials, carbon and graphite materials, cement and concrete as well as new type inorganic materials.

Volume 10 — Composite Materials Engineering, written by Yi Xiaosou, Du Shanxi and Zhang Litong, et al. It covers composites, reinforcement materials, polymer materials, weave composite interface, industrial polymer composite and fiberglass, advanced resin based composites, thermal plastic polymer and composites, metal materials interface, metal matrix composites, ceramic (glass) matrix composites, carbon matrix composites, composite mechanics and design, composite structure design and analysis, performance problems, characterization and quality control of composites, functional composites and new type composites, etc.

Volumes 11 through 13 — Functional Information Materials Engineering, written by Wang Zangzuo, Chen Liqian and Tu Hailing et al. These three volumes not only present the status quo, the latest progress and development of functional information materials applied abroad, but also pay attention to the R & D and industrialized achievements obtained in China. It is the first time in the nation to summarize systematically on such materials as the semiconducting materials, storage materials, display materials, fibre materials, rare earth materials, superconducting materials, photon crystals and nanomaterials applied in IT field where the materials and parts used for the information gain, transmission, memory, display and dispose are involved. The structure, performance and fabrication process of a wide range of materials and the manufacture and application of electronic parts are also introduced in detail.

Volumes 14 — Powder Metallurgical Materials Engineering, written by Han Fenglin, Ma Fukang and Cao Yongjia, et al. (46 scholars), in 7 chapters and about 3 million words. It covers the production and characteristic, performance test and relevant standards of metal powders, powder metallurgical forming, binding technology, processing, quality control, powder metallurgical materials and their applications and development, etc. It expatiates in detail iron base and non–iron base powder metallurgical materials, powder metallurgical stainless steels, tool steels, refractory metals and performance, relevant standards and test methods of carbide metals and so on. In addition, it also introduces the applications and development of powder metallurgical bearings, structural components, friction materials, cellular metal materials and nanomaterials as well as spray forming technique and so on.

Volume 15 — Heat Treatment of Materials, written by Fan Dongli, Pan Jiansheng, Xu Yueming and Tong Xiaohui, et al., in 8 chapters and about 2.7 million words. It covers the fundamentals of heat treatment, heat treatment technique and equipment, heat treatment of materials, heat treatment CAD and CAE, automation of production, clean production, safety, quality control and non–destructive examination, etc.

Volumes 16 and 17 — Materials Surface Engineering, written by Xu Binshi and Liu Shichao, et al. (over 50 scholars), in 16 chapters. The organizations taking part in compiling the Volumes 16 and 17 include the Academy of Armored Forces Engineering of PLA, Nanjing Polytechnic University, Xi’an Jiaotong University, China Academy of Machinery Science & Technology, Tsinghua University, Harbin Institute of Technology, Institute of Metal Research CAS, University of Birmingham, Central Iron & Steel Research Institute, University of Science and Technology Beijing, Beijing Polytechnic University, etc. These two volumes consist
of three parts: (1) the general knowledge about surface engineering that covers the connotation, foundation, classify, development history of surface engineering, surface failure and prevention & cure in materials service, interface binding mechanism of surface cladding; (2) the surface engineering technology that covers the fundamental principle, applied occasion, principle of technical selection, principles of materials selection, quality inspection and control, safety and protection for coating and decorate, thermal spraying, overlay welding, electroplate, electrical brush plating, chemical plating, transforming film technology, chemical heat treatment, hot dip coating, gaseous phase deposit, high energy beam surface engineering, nano–surface engineering, seal up for keeping and packaging of materials; etc.; (3) comprehensive application of surface engineering technology that covers the selection principle of single and complex surface engineering technologies, design of coating materials under different service conditions and economic analysis of surface engineering technology.

● Volumes 18 and 19 — Foundry Forming Engineering of Materials, written by Liu Baicheng and Huang Tianyou et al. These two volumes cover cast alloys and melting, the fundamentals of foundry forming technology and sand casting, etc. (in Volume 18), and special casting, foundry forming CAD/CAE, quality inspecting and control in the casting production (in Volume 19).

● Volumes 20 and 21 — Plasticity Forming Engineering of Materials, written by Hu Zhenghuan and Xia Juchen, et al. with about 4 million words. These two volumes cover basic principle of plasticity forming, forging forming, drawing of slab stock, rolling formering of slab tubing and parts, special forging forming, special forming of slab tubes, extrude forming of shaped section, plasticity forming CAD/CAM, quality control and test, etc.

● Volumes 22 and 23 — Welding Engineering of Materials, written by Shi Yaowu et al. (over 80 scholars), in 9 chapters and about 6 million words. It covers various welding methods, techniques and equipment that are more mature and widely applied, and the welding methods and techniques of common used materials, as well as some advanced welding techniques such as high energy beam current welding, welding under rigorous environment, automation of welding process and welding re-manufacture, etc.

● Volumes 24 and 25 — Special Forming/ and Processing Engineering of Materials, written by Wang Zhiyao et al. (over 50 scholars) in seven chapters and about 4 million words. The volumes cover electrical discharge forming technology, NC electrical discharge line cutting technology, electrochemical machining technology, rapid prototyping and manufacture, quality control and inspection of electromachining machine tool, etc.

● Volume 26 — Characterization of Materials and Inspection Technology, written by Xu Zuyao, Huang Liben and Yan Guoqing et al. (over 80 scholars), in 11 chapters and about 2.5 million words. It covers basic principle of characterization of materials and inspection technology, methods of chemical composition analysis, chemical composition analysis of common used materials, physical property testing, mechanical property testing, chemical property testing, metallographic examination, X-ray diffraction analysis, electron microscopical analysis, nuclear technology analysis and other characterization and testing technologies and so on.