Mechanical Code Essentials: Based on the 2021 *International Mechanical Code*®

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ISBN: 978-1-952468-79-7 (soft-cover edition)
ISBN: 978-1-955636-22-3 (PDF download)

Plumbing-Heating-Cooling Contractors—National Association (PHCC): 180 S. Washington Street – Suite 100, Falls Church, VA 22046; Phone: (703) 237-8100, (800) 533-7694, www.phccweb.org

Errata on various ICC publications may be available at www.iccsafe.org/errata.

First Printing: April 2022

PRINTED IN THE USA

T027770

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Preface

Mechanical Code Essentials: Based on the 2021 *International Mechanical Code*® (IMC®) (Includes 2021 IRC mechanical provisions and a chapter on fuel gas piping) was developed to address the need for an illustrated text explaining the essentials of the mechanical code—those provisions essential to understanding the application of the code to the most commonly encountered mechanical practices. Additionally, fuel gas piping and appliance installation are covered with references to the applicable sections of the 2021 *International Fuel Gas Code*® (IFGC®) and the 2021 *International Residential Code*® (IRC®).

Anyone involved in the design, installation or inspection of mechanical systems will benefit from this book. Beginner and experienced inspectors, plan checkers, installers, contractors, home builders, architects, designers, home inspectors and students of mechanical technology or related fields will gain understanding and practical application of the frequently used provisions of the 2021 edition of the IMC, plus provisions from IRC mechanical and IFGC piping.

Many different types of mechanical design and installation requirements are presented in a user-friendly manner throughout this book. Systems relating to duct and ventilation, exhaust, combustion air and venting, refrigeration, fuel piping and hydronics are well illustrated and discussed in this book, giving the reader a well-rounded focus.

The information in this book has been organized by the different purposes of the code. It discusses the administrative requirements of the mechanical code. The provisions used to install equipment and appliances are covered in the general regulations portion of the book. Ventilation topics include

requirements and examples of natural and mechanical systems as well as the use of different types of exhaust systems within buildings and spaces. The discussion of duct systems includes requirements used in the design and construction to ensure that proper equipment, methods and materials are applied for air distribution systems. Combustion air and venting parts of the book will provide specific requirements for combustion air and different types of venting systems with respect to appliance fuel types. Specific requirements for many types of mechanical appliances will also be discussed. Hydronic and refrigeration provisions of the code have been put into easy-to-understand language. Finally, fuel-gas piping requirements and pipe sizing will be addressed in a step-by-step approach.

Correct and reasonable application of the code provisions is enhanced by a basic understanding of the code development process, the scope, intent and correlation of the family of International Codes®, and the proper administration of those codes. Such fundamental information is provided in the opening chapters of this publication. The book also explains the interaction of a mechanical code with other local, state or federal regulations.

This book does not intend to cover all provisions of the IMC, IRC and IFGC or all of the accepted materials and methods of mechanical design and installation. Focusing in some detail on the most common mechanical provisions affords an opportunity to fully understand the essentials without exploring every variable and alternative. This is not to say that information not covered is any less important or valid. This book is best used as a companion to the IMC, IRC and IFGC, which should be referenced for more complete information.

ABOUT THE INTERNATIONAL MECHANICAL CODE® AND THE INTERNATIONAL FUEL GAS CODE®

The *International Mechanical Code* (IMC) establishes minimum requirements for mechanical systems using prescriptive- and performance-related provisions. The *International Fuel Gas Code* (IFGC) establishes minimum requirements for fuel gas systems and gas-fired appliances using prescriptive- and performance-related provisions. The IMC and IFGC are founded on broad-based principles that make possible the use of new materials and new mechanical designs.

The IMC and IFGC are two of the codes in the family of International Codes published by the International Code Council® (ICC®). All are maintained and updated through an open code development process and are available internationally for adoption by the governing authority to provide consistent enforceable regulations for the built environment.

The impact of the IMC and IFGC extends well beyond the regulatory arena, as it is used in a variety of nonregulatory settings, including:

- Voluntary compliance programs such as those promoting sustainability, energy efficiency and disaster resistance.
- The insurance industry, to estimate and manage risk, and as a tool in underwriting and rate decisions.
- Certification and credentialing of individuals involved in the fields of building design, construction and safety.
- Certification of building and construction-related products.
- US federal agencies, to guide construction in an array of government-owned properties.
- Facilities management.
- "Best practices" benchmarks for designers and builders, including those who are engaged in projects in jurisdictions that do not have a formal regulatory system or a governmental enforcement mechanism.
- College, university and professional school textbooks and curricula.

ABOUT THE INTERNATIONAL RESIDENTIAL CODE®

The *International Residential Code* (IRC) is a comprehensive, stand-alone residential code that establishes minimum regulations for the construction of one- and two-family dwellings and townhouses up to three stories in height, including provisions for fire and life safety, structural design, energy conservation and mechanical, fuel gas, plumbing and electrical systems. The IRC incorporates prescriptive provisions for conventional construction as well as performance criteria that allow the use of new materials and new building designs. Chapters 12 through 23 provide requirements for the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and used to control environmental conditions within residential buildings covered by the IRC. Chapter 24 provides specific requirements related to fuel-gas piping systems, fuel gas appliances, combustion air, appliance venting and associated gas equipment.

ACKNOWLEDGMENTS

Mechanical Code Essentials is the result of many hours of research and collaborative effort. The author would like to thank those people who provided valuable assistance and contribution to developing this book. The knowledge and experience of the ICC staff were instrumental in its development. Jessie Sorensen, Technical Staff in Product Development spent tireless hours reviewing and updating the draft. Sandra Hyde, Managing Director, and Doug Thornburg, Vice President of Product Development, and Sharon Gordy and Sue Brockman of the Publications department also contributed to the accuracy and quality of this document.

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Mr. Flanik has several decades of construction, design, plan review and inspection experience. He is an International Code Council (ICC) Certified Master Code Professional (MCP) and holds over 40 various licenses and certifications. Jerry is the President of Associated Consulting Solutions, LLC (ACS) in Cleveland, Ohio. ACS provides plan review services in all disciplines for building departments throughout the United States, as well as pre- and post-design analysis services, and code consulting

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Mr. Flanik holds a Bachelor of Science Degree in Mechanical Engineering, a Bachelor of Science Degree in Electrical Engineering and an Associate of Science Degree in Civil Engineering Technology. Additionally, Jerry is a long-time member of UA Pipe Fitters Local Union #120 in Cleveland, Ohio. He is also an adjunct faculty instructor at Lakeland Community College in the Civil and Electrical Engineering Departments. Jerry is a professional consultant and code expert for corporations and government agencies throughout the United States and provides educational training for the International Code Council throughout the world.

Jerry would like to thank all of the people that mentored him early in his career in the building trades and his college professors that spent late nights and even weekends working with him to understand mechanical and electrical engineering courses. He would also like to thank the International Code Council staff and members who have always been a great resource of knowledge and expertise.

ABOUT PHCC BEST PEOPLE. BEST PRACTICES.®

The premiere organization for the p-h-c professional, PHCC provides legislative advocacy, education and training to approximately 3,300 plumbing and HVACR open shop and union businesses and 65,000 technicians. Our members work in the residential, commercial, new construction, industrial and service and repair segments of the construction industry. Members of PHCC have access to a wide variety of resources and services, strengthening their reputation as the best choice for professionalism, reliable products and knowledgeable service—and as a proud protector

of public health and safety and the environment. Approximately 125 state and local association affiliates are part of PHCC's chapter network.

https://www.phccweb.org

ABOUT THE INTERNATIONAL CODE COUNCIL

The International Code Council is the leading global source of model codes and standards and building safety solutions that include product evaluation, accreditation, technology, codification, training and certification. The Code Council's codes, standards and solutions are used to ensure safe, affordable and sustainable communities and buildings worldwide. The International Code Council family of solutions includes the ICC Evaluation Service, the International Accreditation Service, General Code, S. K. Ghosh Associates, NTA Inc., Progressive Engineering Inc., ICC Community Development Solutions and the Alliance for National & Community Resilience. The Code Council is the largest international association of building safety professionals and is the trusted source of model codes and standards, establishing the baseline for building safety globally and creating a level playing field for designers, builders and manufacturers.

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