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ANSI/ASHRAE/ACCA Standard 183-2007 (RA 2020) Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

Standard 183 was created in a collaborative effort between ASHRAE and ACCA, the Air Conditioning Contractors of America. It establishes minimum requirements for performing peak cooling and heating load calculations for buildings except low-rise residential buildings. Although there are many methods available to perform peak cooling and heating load calculations, the intent of this standard is to establish a minimum level of requirements that is as inclusive of as many methods as possible while still being restrictive enough to mandate an appropriate level of care and accuracy. An accurate estimate of peak cooling or heating load requires not only that a sound method be used but also that inputs to the method are reasonable and realistic (the execution of the method).

The heat transfer interactions that occur outside and inside a conditioned building are complex and involve many interrelated variables. All load calculation methods therefore involve some level of simplification of the actual interactions among these variables to determine practical solutions to these very complex problems. The requirements in this standard that relate to the load calculation method are technical to the extent that they address these simplifications of the fundamental heat transfer interactions. If a method oversimplifies the problem, then an inaccurate load estimate can result. Complying with this standard requires knowledge of the underlying principles of the methods used and the techniques that these methods use to address the fundamental heat transfer interactions.

There is a distinction in this standard between zone load and system load. This standard is intended to address the calculation of zone load, but it is impossible to completely decouple the system load or capacity calculation from the zone load calculation. Systems and the processes to calculate their loads or capacities vary dramatically. Some aspects of the overall approach to systems are included in this standard, but the standard is not intended to be a comprehensive or detailed discussion of how to calculate system loads. Users of this standard are cautioned not to confuse zone heat gain with system sizing.

This is a reaffirmation of Standard 183-2007. This standard was prepared under the auspices of ASHRAE. It may be used, in whole or in part, by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interests of obtaining uniform guidelines throughout the industry. This 2020 reaffirmation includes editorial updates to Sections 3.2 and 4.1.

1. PURPOSE

This standard establishes requirements for performing peak cooling and heating load calculations for buildings except low-rise residential buildings.

2. SCOPE

This standard sets minimum requirements for methods and procedures used to perform peak cooling and heating load calculations for buildings except low-rise residential buildings.

3. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

3.1 Terms Defined in This Standard

beam solar: the component of solar radiation received from the sun without being scattered by the atmosphere or reflected by other surfaces.

building location: for purposes of load calculation, the building's latitude and longitude or the country, state, and city.

convective heat gain: the portion of a heat gain that is transferred by convection to air inside a building.

cooling load: a general term used to refer to the sensible and latent cooling load of a zone or an HVAC system.

diffuse solar: the component of solar radiation composed of the sky diffuse and ground diffuse solar flux.