

# Cooling Load Calculation

## Cold Room

Transmission Load  
~5 - 15% of total

Cooling Loads  
Transmission (5-15%)

Heat always flows from hot to cold. The interior of a cold room is a lower temperature than its surroundings so heat is always trying to enter



Roof

Walls

Floor

Higher if exposed to direct sunlight

# Cooling Load Calculation Example

**Faye C. McQuiston, American Society  
of Heating, Refrigerating and Air-  
Conditioning Engineers, Jeffrey D.  
Spitler**

## Cooling Load Calculation Example:

**HVAC Cooling Load - Calculations and Principles** A. Bhatia, 2014-10-16 Heating and cooling load calculations are carried out to estimate the required capacity of heating and cooling systems which can maintain the required conditions in the conditioned space To estimate the required cooling or heating capacities one has to have information regarding the design indoor and outdoor conditions specifications of the building specifications of the conditioned space such as the occupancy activity level various appliances and equipment used etc and any special requirements of the particular application For comfort applications the required indoor conditions are fixed by the criterion of thermal comfort while for industrial or commercial applications the required indoor conditions are fixed by the particular processes being performed or the products being stored Generally heating and cooling load calculations involve a systematic and stepwise procedure which account for all the building energy flows In practice a variety of methods ranging from simple rules of thumb to complex transfer function methods are used to arrive at the building loads This short quick book provides a procedure for preparing a manual calculation for cooling load using CLTD CLF method suggested by ASHRAE and includes two detailed examples For more advanced methods such as TFM the reader should refer to ASHRAE and other handbooks Learning Objective At the end of this course the student should be able to 1 Understand the basic terminology and definitions related to air conditioning load calculations 2 Explain the differences between heating and cooling load design considerations 3 Explain the difference between 1 space heat gain v s cooling load 2 space cooling v s cooling load and 3 external loads v s internal loads 4 Differentiate between sensible and latent loads 5 List commonly used methods for estimating cooling loads 6 Estimate the internal and external cooling loads using CLTD CLF method from building specifications design indoor and outdoor conditions occupancy etc 7 Describe various equations and the information sources to determine conductive load through opaque building elements 8 Describe various equations and information sources to determine the solar transmission load through glazing 9 Describe various equations and information sources to determine the internal load due to people lights and power appliances 10 Determine the supply air flow rate 11 Learn by examples the detailed methodology to cooling load calculations 12 Learn the functional parameters of software programs such as TRACE 700 and CHVAC

Cooling and Heating Load Calculation Manual, 1980 *Cooling and Heating Load Calculation Manual* American Society of Heating, Refrigerating and Air-Conditioning Engineers, William Rudoy, Joseph F. Cuba, 1979 **Cooling and Heating Load Calculation Manual** Faye C. McQuiston, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Jeffrey D. Spitler, 1992 Provide a comprehensive source of theory procedures and data for cooling and heating load calculations for other than residential buildings Cooling Manufacturing Facilities & Applications Charles Nehme, Cooling systems play a crucial role in maintaining optimal conditions within manufacturing facilities impacting product quality equipment longevity worker safety and energy efficiency As manufacturing processes become more complex and sensitive to environmental

variables the demand for tailored efficient cooling solutions has intensified In industries ranging from electronics and pharmaceuticals to automotive and food production precise temperature and humidity control are essential for both operational stability and regulatory compliance This book *Manufacturing Facilities Cooling and Applications* was created to provide a comprehensive guide for engineers facility managers and industry professionals seeking to design implement and maintain cooling systems that meet the unique demands of manufacturing environments By exploring the fundamentals of cooling technology and delving into specific applications across diverse manufacturing sectors this book offers practical insights and tools to achieve effective cooling with a focus on energy efficiency sustainability and cost effectiveness Within these pages you will find discussions on a wide range of cooling systems from direct and indirect cooling methods to the latest advancements in automation and energy saving technologies We will explore the unique challenges posed by various manufacturing processes addressing issues like high heat loads contaminant control and extreme humidity management Real world case studies and examples provide insight into how leading facilities are leveraging innovative cooling solutions to enhance productivity and reduce their environmental footprint It is my hope that this book serves as both an educational resource and a practical reference empowering readers to make informed decisions about cooling system design operation and maintenance By adopting strategies that align with industry best practices and sustainability goals manufacturers can achieve optimal performance while minimizing their impact on the environment Thank you for joining me on this exploration of cooling technology in manufacturing I look forward to the knowledge and innovations that will emerge as we collectively work toward more sustainable and efficient manufacturing facilities

Charles Nehme *Subroutine Algorithms for Heating and Cooling Loads to Determine Building Energy Requirements* Ashrae Task Group on Energy Requirements. Subcommittee for Heating and Cooling Loads,1975 Load Calculation Applications Manual Jeffrey D. Spitler,2009 The Load Calculation Applications Manual builds upon three previous ASHRAE publications that focus on the calculation of cooling and heating loads for commercial buildings Whether you are a new engineer who is learning how to do load calculations or a veteran who wishes to learn the radiant time series RTS method this book is a must have resource Outlined in the manual are two methods for calculating cooling loads in nonresidential buildings the heat balance HB method and the RTS method Both methods were first fully presented for use in design load calculations in the predecessor to this volume *Cooling and Heating Load Calculation Principles* But much has changed since the book was first published in 1998 The Load Calculation Applications Manual steps in where the last book left off to provide you with the latest information regarding load calculations In the book s early chapters an overview of the heat transfer processes present in buildings and a brief discussion of how they are analyzed together in order to determine the cooling load are provided Later chapters focus on the theory and application of the RTS method systems and psychrometrics heating load calculations and the HB method and its implementation The accompanying CD contains Microsoft Excel spreadsheets that compute cooling loads using the RTS

method These spreadsheets calculate the solar irradiation conduction time factor series and radiant time factors utilized by the method Plus you can adapt the spreadsheets to compute cooling loads for a wide range of buildings ASHRAE Handbook of Fundamentals American Society of Heating, Refrigerating and Air-Conditioning Engineers,1972 **Load Calculation** ,1988 **ASHRAE Handbook** ,2005 **Heating and Cooling Load Calculations** P. G. Down,1969 *Air Conditioning, Heating and Ventilating* ,1959 Analysis and Design of Heating, Ventilating, and Air-conditioning Systems Herbert W. Stanford,1988 **Subdivisions and Sun** Henry Fliess and Partners, Architects,M.M. Dillon Limited,John Hix, Architect and Planner,Ontario. Ministry of Energy,1979 **ASHRAE Handbook & Product Directory** American Society of Heating, Refrigerating and Air-Conditioning Engineers,1978 *ASHRAE Journal* ,1993 *Transactions of the American Society of Heating and Ventilating Engineers* American Society of Heating and Ventilating Engineers,1952 **Transactions** American Society of Heating and Ventilating Engineers,1943 **Transactions** American Society of Heating, Refrigerating and Air-Conditioning Engineers,1967 **A Builder's Guide to Energy Efficient Homes** Georgia Institute of Technology. Engineering Experiment Station,1982

The Top Books of the Year Cooling Load Calculation Example The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous compelling novels enthraling the hearts of readers worldwide. Lets delve into the realm of bestselling books, exploring the fascinating narratives that have captivated audiences this year. The Must-Read : Colleen Hoover's "It Ends with Us" This poignant tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover skillfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can succeed. Uncover the Best : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids compelling storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Discover the Magic : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens spins a tale of resilience, survival, and the transformative power of nature, captivating readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a exceptional and suspenseful novel that will keep you speculating until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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