# ENERGY CODE SUPPORT PROGRAM

# news


Issue One | Fall 2024

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Contact us to Schedule your FREE Training

www.MinnesotaEnergyCodeSupport.org

or Email our team at:
mnecsp@shumscoda.com

## PROGRAM OVERVIEW

The Energy Codes Support Program was created to provide support and assistance to the construction industry and building safety professionals in their respective efforts to build safe structures that comply with the provisions of the state energy conservation and construction codes. The Circuit Rider is your source for FREE on-site assistance, training, and technical expertise to help your community navigate the Energy Code; best practices for implementing effective code compliant construction techniques; and details that will keep your team and building projects up to date with the latest in energy-efficient building codes.

Interested in hosting a local training or just to sit down and have a friendly visit to discuss the program, just contact one of our Circuit Riders.

You can visit our website for more contact information, upcoming trainings, and technical documents and videos to support your project and ensure safe, code compliant structures in your community.

MINNESOTA ENERGY CODE SUPPORT PROGRAM



# Illuminating the Life-Safety impacts of the Energy Code

Energy efficiency isn't just a buzzword; it's a powerful tool that holds the key to protecting life, ensuring building safety and bolstering community resilience.

As our communities grapple with the challenges of climate change and resource depletion the significance of embracing energy efficiency becomes increasingly evident.  By optimizing our building energy consumption, we can mitigate this environmental impact, enhance our infrastructure's safety, and fortify our communities against the perils of an uncertain future. The benefits of energy efficiency are far-reaching they have a direct and positive impact on our everyday lives.  When it comes to protecting life, energy efficiency is paramount.

Efficient appliances and systems not only reduce energy consumption, but they also decrease the strain on power grids, minimizing the risk of blackouts or electric failures that can have dire consequences. Moreover, through advanced building design and efficient insulation, we can create comfortable living and working environments while lowering the energy demand for heating and cooling. This not only improves the well-being of occupants but also reduces the emission of greenhouse gases and harmful pollutants, thereby safeguarding public health and preserving the quality of the air we breathe.

The true power of energy efficiency lies in its ability to enhance building safety and community resilience. By adopting energy--efficient practices, we can reduce the reliance on non-renewable energy sources, such as fossil fuels, which are susceptible to price volatility and supply disruptions.  This not only makes our energy system more resilient but also fosters economic stability.  Additionally, energy-efficient buildings are designed to withstand natural disasters more effectively, incorporating features such as reinforced structures, energy storage systems, and passive heat-loss design elements.  In times of crisis, these resilient buildings can serve as vital hubs, providing shelter, power, and essential services to the community, ensuring continuity and reducing the strain on emergency response systems.

The Energy Code is an invaluable ally in protecting life, enhancing building safety, and strengthening community resilience. As we face the challenges of the modern world, harnessing the power of energy efficient construction will create a safer, more sustainable and resilient future for all.

# SPRAY FOAM INSULATION

The Minnesota Commercial Energy Code in coordination with the State Building Code provide guidance on the installation and use of foam plastics as part of the building wall and thermal envelope. These regulations include the material characteristics and installation of 'thermal barriers' to prevent the unintended ignition of these materials in an assembly.


Foam plastic insulation has emerged as a popular construction material offering a range of benefits that contribute to improved energy conservation; more versatility in installation; and can reduce heat transfer in residential and commercial buildings. Foam plastics have become an indispensable component in the construction industry: primarily used as thermal resistance, unique material characteristics can impact performance, versatility, and durability and are important for installers and inspection staff to be aware of.

## Energy Code Provisions

### 5.2.1 Requirements for all Compliance Paths

The building envelope shall comply with Section 5.1, "General"; Section 5.4, "Mandatory Provisions"; Section 5.7, "Submittals"; Section 5.8, "Product Information and Installation Requirements"; and Section 5.9, "Verification, Testing, Commissioning, and Inspection."

### 5.4.1 Insulation

Where insulation is required in Section 5.5 or Section 5.6, it shall comply with the requirements found in Section 5.8.1.

### 5.8.1.1 Labeling of Building Envelope Insulation

The rated R-value of insulation shall be clearly identified by an identification mark applied by the manufacturer to each piece of building envelope insulation.

### 5.8.1.2 Manufacturer's Installation Instructions

Insulation materials shall be installed in accordance with manufacturers' recommendations and in such a manner as to achieve the rated R-value of insulation.

Table 5.5-6 *Building Envelope* Requirements for Climate Zone 6 (A,B)*

| *Opaque Elements* | Nonresidential: Assembly Maximum | Nonresidential: Insulation Min. *R-Value* | Residential: Assembly Maximum |
|---|---|---|---|
| *Roofs* | | | |
| *Insulation entirely above deck* | U-0.032 | R-30 c.i. | U-0.032 |
| *Metal building*[a] | U-0.031 | R-25 + R-11 *Ls* | U-0.029 |
| *Attic and other* | U-0.021 | R-49 | U-0.021 |
| *Walls, above Grade* | | | |
| *Mass* | U-0.080 | R-13.3 c.i. | U-0.071 |
| *Metal building* | U-0.050 | R-0 + R-19 c.i. | U-0.050 |
| *Steel-framed* | U-0.049 | R-13 + R-12.5 c.i. | U-0.049 |
| *Wood-framed and other* | U-0.051 | R-13 + R-7.5 c.i. or R-19 + R-5 c.i. | U-0.051 |
| *Wall, below Grade* | | | |
| *Below-grade wall* | C-0.092 | R-10 c.i. | C-0.063 |
| *Floors* | | | |
| *Mass* | U-0.051 | R-16.7 c.i. | U-0.051 |
| *Steel joist* | U-0.032 | R-38 | U-0.032 |
| *Wood-framed and other* | U-0.027 | R-38 | U-0.027 |
| *Slab-on-Grade Floors* | | | |
| *Unheated* | F-0.510 | R-20 for 24 in. | F-0.434 |
| *Heated* | F-0.688 | R-20 for 48 in. | F-0.671 |
| *Opaque Doors* | | | |
| *Swinging* | U-0.370 | | U-0.370 |
| *Nonswinging* | U-0.310 | | U-0.310 |

| *Fenestration* | Assembly Max. U | Assembly Max. *SHGC* | Assembly Min. *VT/SHGC* | Assembly Max. U |
|---|---|---|---|---|
| *Vertical Fenestration, 0% to 40% of Wall* | | | | |
| *Fixed* | 0.34 | 0.38 | 1.10 (for all types) | 0.34 |
| *Operable* | 0.42 | 0.34 | | 0.42 |
| *Entrance door* | 0.63 | 0.34 | | 0.63 |
| *Skylight, 0% to 3% of Roof* | | | | |
| All types | 0.47 | 0.40 | NR | 0.50 |

* The following definitions apply: c.i. = *continuous insulation* (see Section 3.2), FC = f
NR = no (insulation) requirement.
a. When using the *R-value* compliance method for *metal building roofs*, a thermal spa
b. Exception to Section 5.5.3.2 applies for *mass walls above grade*.

Table 5.5-7 *Building Envelope* Requirements for Climate Zone 7*

| *Opaque Elements* | Nonresidential: Assembly Maximum | Nonresidential: Insulation Min. *R-Value* | Residential: Assembly Maximum | Residential: Insulation Min. *R-Value* | Semiheated: Assembly Maximum | Semiheated: Insulation Min. *R-Value* |
|---|---|---|---|---|---|---|
| *Roofs* | | | | | | |
| *Insulation entirely above deck* | U-0.028 | R-35 c.i. | U-0.028 | R-35 c.i. | U-0.039 | R-25 c.i. |
| *Metal building*[a] | U-0.029 | R-30 + R-11 *Ls* | U-0.029 | R-30 + R-11 *Ls* | U-0.037 | R-19 + R-11 *Ls* or R-25 + R-8 *Ls* |
| *Attic and other* | U-0.017 | R-60 | U-0.017 | R-60 | U-0.027 | R-38 |
| *Walls, above Grade* | | | | | | |
| *Mass* | U-0.071 | R-15.2 c.i. | U-0.071 | R-15.2 c.i. | U-0.123 | R-7.6 c.i. |
| *Metal building* | U-0.044 | R-0 + R.22.1 c.i. | U-.044 | R-0 + R.22.1 c.i. | U-0.072 | R-0 + R-13 c.i. |
| *Steel-framed* | U-0.049 | R-13 + R-12.5 c.i. | U-0.042 | R-13 + R-15.6 c.i. | U-0.064 | R-13 + R-7.5 c.i. |
| *Wood-framed and other* | U-0.051 | R-13 + R-7.5 c.i. or R-19 + R-5 c.i. | U-0.051 | R-13 + R-7.5 c.i. or R-19 + R-5 c.i. | U-0.064 | R-13 + R-3.8 c.i. |
| *Wall, below Grade* | | | | | | |
| *Below-grade wall* | C-0.063 | R-15 c.i. | C-0.063 | R-15 c.i. | C-0.119 | R-7.5 c.i. |
| *Floors* | | | | | | |
| *Mass* | U-0.042 | R-20.9 c.i. | U-0.042 | R-20.9 c.i. | U-0.074 | R-10.4 c.i. |
| *Steel joist* | U-0.032 | R-38 | U-0.032 | R-38 | U-0.052 | R-19 |
| *Wood-framed and other* | U-0.027 | R-38 | U-0.027 | R-38 | U-0.051 | R-19 |
| *Slab-on-Grade Floors* | | | | | | |
| *Unheated* | F-0.510 | R-20 for 24 in. | F-0.434 | R-20 for 48 in. | F-0.730 | NR |
| *Heated* | F-0.671 | R-25 for 48 in. | F-0.671 | R-25 for 48 in. | F-0.860 | R-15 for 24 in. |
| *Opaque Doors* | | | | | | |
| *Swinging* | U-0.370 | | U-0.370 | | U-0.370 | |
| *Nonswinging* | U-0.310 | | U-0.310 | | U-0.310 | |

| *Fenestration* | Nonresidential: Assembly Max. U | Nonresidential: Assembly Max. *SHGC* | Nonresidential: Assembly Min. *VT/SHGC* | Residential: Assembly Max. U | Residential: Assembly Max. SHGC | Residential: Assembly Min. *VT/SHGC* | Semiheated: Assembly Max. U | Semiheated: Assembly Max. *SHGC* | Semiheated: Assembly Min. *VT/SHGC* |
|---|---|---|---|---|---|---|---|---|---|
| *Vertical Fenestration, 0% to 40% of Wall* | | | | | | | | | |
| *Fixed* | 0.29 | 0.40 | 1.10 (for all types) | 0.29 | 0.40 | 1.10 (for all types) | 0.36 | NR (for all types) | NR (for all types) |
| *Operable* | 0.36 | 0.36 | | 0.36 | 0.36 | | 0.44 | | |
| *Entrance door* | 0.63 | 0.36 | | 0.63 | 0.36 | | 0.63 | | |
| *Skylight, 0% to 3% of Roof* | | | | | | | | | |
| All types | 0.44 | NR | NR | 0.44 | NR | NR | 0.75 | NR | NR |

* The following definitions apply: c.i. = *continuous insulation* (see Section 3.2), FC = filled cavity (see Section A2.3.2.5), *Ls* = *liner system* (see Section A2.3.2.4), NR = no (insulation) requirement.
a. When using the *R-value* compliance method for *metal building roofs*, a thermal spacer block is required (see Section A2.3.2).

## Common Foam Plastics

***Expanded Polystyrene (EPS)***
*A lightweight, rigid foam board; commonly used in walls, roofs, and foundations.*

*Typ. ranges from R-3.4 --- R-3.9 per inch*

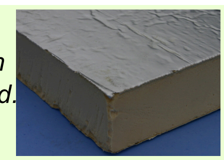


***Extruded Polystyrene (XPS)***
*A dense, closed-cell foam board; commonly used in below-grade walls and foundations.*

*Typ. ranges from R-4.7 --- R-5.2 per inch*

***Polyisocyanurate (PIR)***
*A foil-faced foam board; commonly used in roofs and where moisture control is needed.*

*Typ. ranges from R-6.2 --- R-7.2 per inch*



***Spray Foam Sealants (XPS)***
*A lightweight, rigid foam board; commonly used in walls, roofs, and foundations.*

*Typ. ranges from R-1.2- to R-2.0 per inch*

***Low-Density Spray Foam (Open Cell)***
*An aerosol applied foam plastic commonly used in walls, roofs, and foundations.*

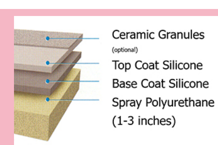
*Typ. ranges from R-3.5 to R-4.2 per inch*

***Medium-Density Spray Foam (Closed Cell )***
*A sprayed application used in walls, roofs, and foundations for thermal, vapor and air control.*

*Typ. ranges from R-6.0 to R-7.0 per inch*

***High-Density Spray Foam (Roof)***
*A dense sprayed foam commonly used in above deck roof applications.*

*Typ. ranges from R-7.0 --- R-9.0 per inch*




**This handout summarizes the information contained in our technical documents on the subject. Contact the Circuit Rider for more details or to obtain a copy of these code specific-resources.*

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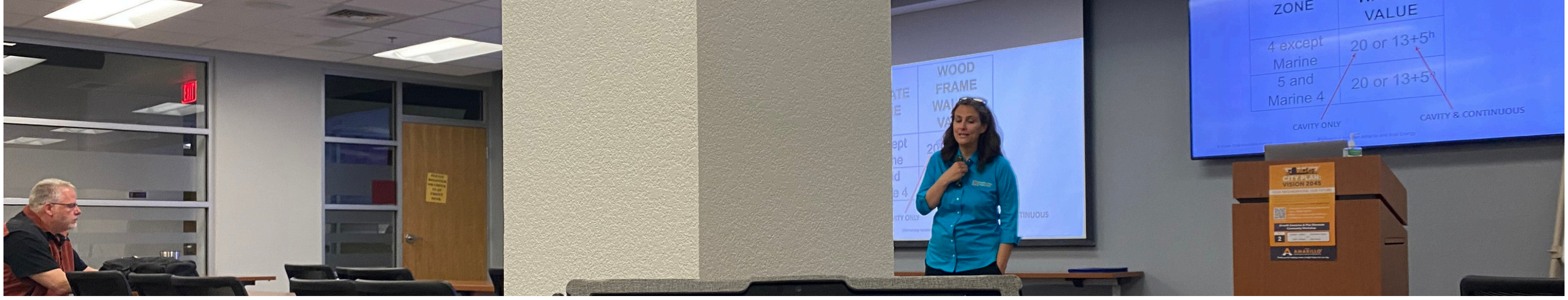
FOR MORE INFO VISIT
WWW.MINNESOTAENERGYCODESUPPORT.ORG




# Upcoming Trainings

## Monthly Webinar Series

1st & 3rd Thursdays, 10:30am-11:30am CT

*AIA-HSW, ICC & DLI continuing education credits will be provided for completed trainings*


This free training will provide builders, designers, inspection staff, and plan reviewers a regular opportunity to gain a comprehensive understanding of energy code requirements, offering insight into compliance strategies and best practices. Through interactive discussions and case examples, attendees will gain the knowledge and tools necessary to optimize energy efficiency in their projects while complying with the code.

Click or Scan to Register

- **9/05 - Mechanical System Considerations for Energy Code Compliance**
- **9/19 - Power and Lighting Design Considerations for Energy Code Compliance**
- **10/03 - Demystifying the Testing Requirements of the Energy Code**
- **10/17 - Inspecting for Thermal Envelope Compliance**

## MEET YOUR INSTRUCTORS

Hope Medina
Certified Building Official
Certified Sustainability Professional

Gil Rossmiller
Energy Specialist
Code Consultant

Joshua Harmon
Certified Building Official
Certified Sustainability Professional

Email our team at:
mnecsp@shumscoda.com


**Topic: THE COMMERCIAL ENERGY CODE REQUIREMENTS FOR THE THERMAL ENVELOPE AND CODE COMPLIANCE PATHS**

***4HRS OF ICC/AIA-HSW/DLI CEU CREDITS***

***REGISTER ONLINE NOW... SPACE IS LIMITED***

**TUESDAY, August 27**
**8:30am - 12:30pm**

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