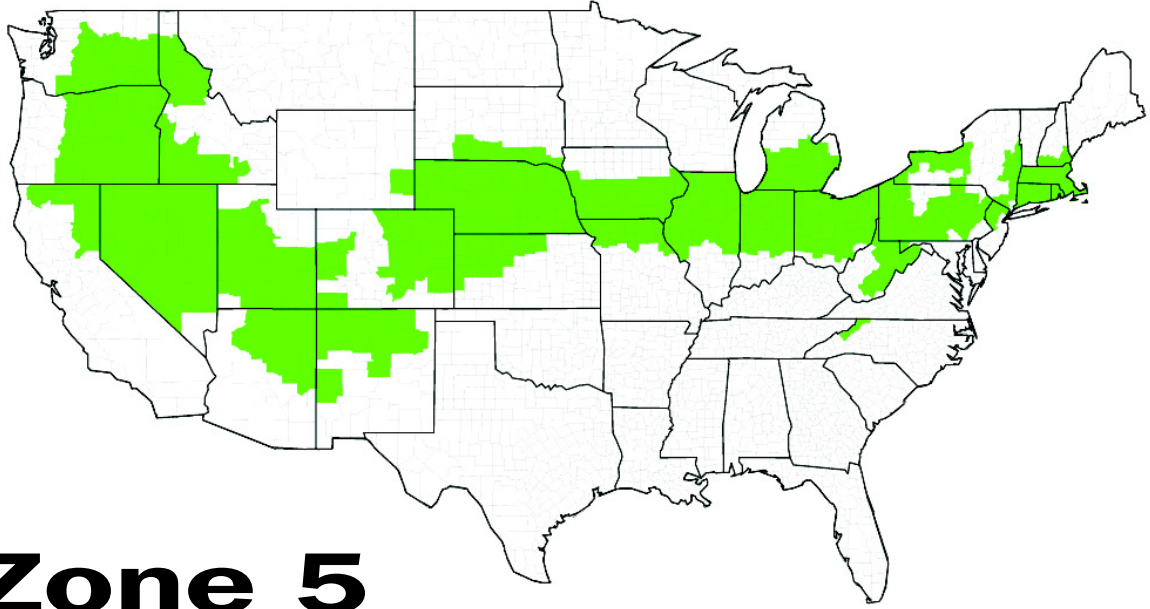


Climate Zone 4 Recommendation Table for Small Retail Buildings

	Item	Component	Recommendation (Minimum or Maximum)	How-To Tips in Chapter 5	✓
Envelope	Roof	Insulation entirely above deck	R-20 c.i.	EN1-2, 17, 20-21	
		Metal building	R-13 + R-19	EN1, 3, 17, 20-21	
		Attic and other	R-38	EN4, 17-18, 20-21	
		Single rafter	R-38 + R-5 c.i.	EN5, 17, 20-21	
		Solar reflectance index (SRI)	No recommendation	EN1	
	Walls	Mass (HC > 7 Btu/ft ²)	R-13.3 c.i.	EN6, 17, 20-21	
		Metal building	R-13 + R-13	EN7, 17, 20-21	
		Steel framed	R-13 + R-7.5 c.i.	EN8, 17, 20-21	
		Wood framed and other	R-13 + R-3.8 c.i.	EN9, 17, 20-21	
		Below-grade walls	R-7.5 c.i.	EN10, 17, 20-21	
	Floors	Mass	R-12.5 c.i.	EN11, 17, 20-21	
		Steel framed	R-30	EN12, 17, 20-21	
		Wood framed and other	R-30	EN12, 17, 20-21	
	Slabs	Unheated	No recommendation	EN13, 17, 19-21	
		Heated	R-7.5 for 12 in.	EN14, 17, 19-21	
Doors – Opaque	Swinging	U-0.50	EN15, 20-21		
	Non-swinging	U-0.50	EN16, 20-21		
Vertical Glazing Including Doors	Area (percent of gross wall)	40%	EN22-23, 27, 28, 29		
	Thermal transmittance	U-0.38	EN22, 25		
	Solar heat gain coefficient (SHGC)	N, S, E, W - 0.41; N only—0.41	EN22		
	Exterior sun control (S, E, W only)	Projection factor > 0.5	EN26, DL3		
Skylights	Area (percent of gross roof)	3%	EN24		
	Thermal transmittance	U-0.69			
	Solar heat gain coefficient (SHGC)	0.32	DL3-10		
Lighting	Interior Lighting	Lighting power density (LPD)	1.3 W/ft ²	EL1, 3, 4, 14, 16-25	
		Linear fluorescent with high-performance electronic ballast	91 mean lm/W	EL7, 8	
		All other sources	50 mean lm/W	EL9,10	
		Dimming controls for daylight harvesting under skylights	Dim fixtures within 10 ft of skylight edge	DL1-9, EL15	
		Occupancy controls	Auto-off all non-sales rooms	EL13	
	Interior room surface reflectances in locations with daylighting	80%+ on ceilings, 70%+ on walls	DL2, EL5		
Additional Interior Lighting for Sales Floor	Additional LPD for adjustable lighting equipment that is specifically designed and directed to highlight merchandise and is automatically controlled separately from the general lighting	0.4 W/ft ² (spaces not listed below) 0.6 W/ft ² (sporting goods, small electronics) 0.9 W/ft ² (furniture, clothing, cosmetics, and artwork) 1.5 W/ft ² (jewelry, crystal, china)	EL1, 2, 10, 11, 14, 20, 21		
Sources	Halogen IR or CMH	EL10-12			
Exterior	Façade and externally illuminated signage	0.2 W/ft ²	EX2, 3, EL5, EL7-12		
HVAC	HVAC	Air conditioner (0-65 kBtuh)	13.0 SEER	HV1-4, 6, 12, 16-17, 20	
		Air conditioner (>65-135 kBtuh)	11.0 EER/11.4 IPLV	HV1-4, 6, 12, 16-17, 20	
		Air conditioner (>135-240 kBtuh)	10.8 EER/11.2 IPLV	HV1-4, 6, 12, 16-17, 20	
		Air conditioner (>240 kBtuh)	10.0 EER/10.4 IPLV	HV1-4, 6, 12, 16-17, 20	
		Gas furnace (0-225 kBtuh - SP)	80% AFUE or E _t	HV1-2, 6, 16, 20	
		Gas furnace (0-225 kBtuh - Split)	80% AFUE or E _t	HV1-2, 6, 16, 20	
		Gas furnace (>225 kBtuh)	80% E _c	HV1-2, 6, 16, 20	
		Heat pump (0-65 kBtuh)	13.0 SEER/7.7 HSPF	HV1-4, 6, 12, 16-17, 20	
		Heat pump (>65-135 kBtuh)	10.6 EER/11.0 IPLV/3.2 COP	HV1-4, 6, 12, 16-17, 20	
	Heat pump (>135 kBtuh)	10.1 EER/11.0 IPLV/3.1 COP	HV1-4, 6, 12, 16-17, 20		
Economizer	Air conditioners & heat pumps- SP	Cooling capacity > 54 kBtuh	HV23		
Ventilation	Outdoor air damper	Motorized control	HV7-8		
	Demand control	CO ₂ sensors	HV7, 22		
	Ducts	Friction rate	0.08 in. w.c./100 ft	HV9, 18	
		Sealing	Seal class B	HV11	
Location		Interior only	HV9		
	Insulation level	R-6	HV10		
SWH	Service Water Heating	Gas storage (> 75 kBtuh)	90% E _t	WH1-4	
		Gas Instantaneous	0.81 EF or 81% E _t	WH1-4	
		Electric storage (≤ 12 kW and > 20 gal)	EF > 0.99 – 0.0012xVolume	WH1-4	
		Pipe insulation (d < 1½ in./ d ≥ 1½ in.)	1 in./ 1½ in.	WH6	

Note: If the table contains "No recommendation" for a component, the user must meet the more stringent of either Standard 90.1 or the local code requirements in order to reach the 30% savings target.



Zone 5

Arizona

Apache
Coconino
Navajo

California

Lassen
Modoc
Nevada
Plumas
Sierra
Siskiyou

Colorado

Adams
Arapahoe
Bent
Boulder
Cheyenne
Crowley
Delta
Denver
Douglas
Elbert
El Paso
Fremont
Garfield
Gilpin
Huerfano
Jefferson
Kiowa
Kit Carson
La Plata
Larimer
Lincoln
Logan
Mesa
Montezuma
Montrose
Morgan
Phillips
Prowers
Pueblo
Sedgwick
Teller
Washington
Weld
Yuma

Connecticut

All counties

Idaho

Ada
Benewah
Canyon
Cassia
Clearwater
Elmore
Gem
Gooding
Idaho
Jerome
Kootenai

Latah
Lewis
Lincoln
Minidoka
Nez Perce
Owyhee
Payette
Power
Shoshone
Twin Falls
Washington

Illinois

All counties except:
Alexander
Christian
Clay
Clinton
Crawford
Edwards
Effingham
Fayette
Franklin
Gallatin
Hamilton
Hardin
Jackson
Jasper
Jefferson
Johnson
Lawrence
Macoupin
Madison
Marion
Massac
Monroe
Montgomery
Perry
Pope
Pulaski
Randolph
Richland
Saline
Shelby
St. Clair
Union
Wabash
Washington
Wayne
White
Williamson
Brown

Indiana

All counties except:
Clark
Crawford
Daviess
Dearborn
Dubois
Floyd
Gibson

Greene
Harrison
Jackson
Jefferson
Jennings
Knox
Lawrence
Martin
Monroe
Ohio
Orange
Perry
Pike
Posey
Ripley
Scott
Spencer
Sullivan
Switzerland
Vanderburgh
Warrick
Washington

Iowa

All counties except:
Allamakee
Black Hawk
Bremer
Buchanan
Buena Vista
Butler
Calhoun
Cerro Gordo
Cherokee
Chickasaw
Clay
Clayton
Delaware
Dickinson
Emmet
Fayette
Floyd
Franklin
Grundy
Hamilton
Hancock
Hardin
Howard
Humboldt
Ia
Kossuth
Lyon
Mitchell
O'Brien
Osceola
Palo Alto
Plymouth
Pocahontas
Sac
Sioux
Webster
Winnebago
Winneshiek
Worth
Wright

Kansas

Cheyenne
Cloud
Decatur
Ellis
Gove
Graham
Greeley
Hamilton
Jewell
Lane
Logan
Mitchell
Ness
Norton
Osborne
Phillips
Rawlins
Republic
Rooks
Scott
Sheridan
Sherman
Smith
Thomas
Trego
Wallace
Wichita

Maryland

Garrett

Massachusetts

All counties

Michigan

Allegan
Barry
Bay
Berrien
Branch
Calhoun
Cass
Clinton
Eaton
Genesee
Gratiot
Hillsdale
Ingham
Ionia
Jackson
Kalamazoo
Kent
Lapeer
Lenawee
Livingston
Macomb
Midland
Monroe
Montcalm
Muskegon
Oakland
Ottawa
Saginaw

Shiawassee
St. Clair
St. Joseph
Tuscola
Van Buren
Washtenaw
Wayne

Missouri

Adair
Andrew
Atchison
Buchanan
Caldwell
Chariton
Clark
Clinton
Daviess
DeKalb
Gentry
Grundy
Harrison
Holt
Knox
Lewis
Linn
Livingston
Macon
Marion
Mercer
Nodaway
Pike
Putnam
Ralls
Schuyler
Scotland
Shelby
Sullivan
Worth

Nebraska

All counties

Nevada

All counties except:
Clark

New Hampshire

Cheshire
Hillsborough
Rockingham
Strafford

New Jersey

Bergen
Hunterdon
Mercer
Morris
Passaic
Somerset
Sussex
Warren

New Mexico

Catron
Colfax
Harding
Los Alamos
McKinley
Mora
Rio Arriba
Sandoval
San Juan
San Miguel
Santa Fe
Taos
Torrance

New York

Albany
Cayuga
Chautauqua
Chemung
Columbia
Cortland
Dutchess
Erie
Genesee
Greene
Livingston
Monroe
Niagara
Onondaga
Ontario
Orange
Orleans
Oswego
Putnam
Rensselaer
Rockland
Saratoga
Schenectady
Seneca
Tioga
Washington
Wayne
Yates

North Carolina

Alleghany
Ashe
Avery
Mitchell
Watauga
Yancey

Ohio

All counties except:
Adams
Brown
Clermont
Gallia
Hamilton
Lawrence
Pike

Scioto
Washington

Oregon

Baker
Crook
Deschutes
Gilliam
Grant
Harney
Hood River
Jefferson
Klamath
Lake
Malheur
Morrow
Sherman
Umatilla
Union
Wallowa
Wasco
Wheeler

Pennsylvania

All counties except:
Bucks
Cameron
Chester
Clearfield
Delaware
Elk
McKean
Montgomery
Philadelphia
Potter
Susquehanna
Tioga
Wayne
York

Rhode Island

All counties

South Dakota

Bennett
Bon Homme
Charles Mix
Clay
Douglas
Gregory
Hutchinson
Jackson
Melleite
Todd
Tripp
Union
Yankton

Utah

All counties except:
Box Elder
Cache

Carbon
Daggett
Duchesne
Morgan
Rich
Summit
Uintah
Wasatch
Washington

Washington

Adams
Asotin
Benton
Chelan
Columbia
Douglas
Franklin
Garfield
Grant
Kittitas
Klickitat
Lincoln
Skamania
Spokane
Walla Walla
Whitman
Yakima

Wyoming

Goshen
Platte

West Virginia

Barbour
Brooke
Doddridge
Fayette
Grant
Greenbrier
Hampshire
Hancock
Hardy
Harrison
Lewis
Marion
Marshall
Mineral
Monongalia
Nicholas
Ohio
Pendleton
Pocahontas
Preston
Raleigh
Randolph
Summers
Taylor
Tucker
Upshur
Webster
Wetzel