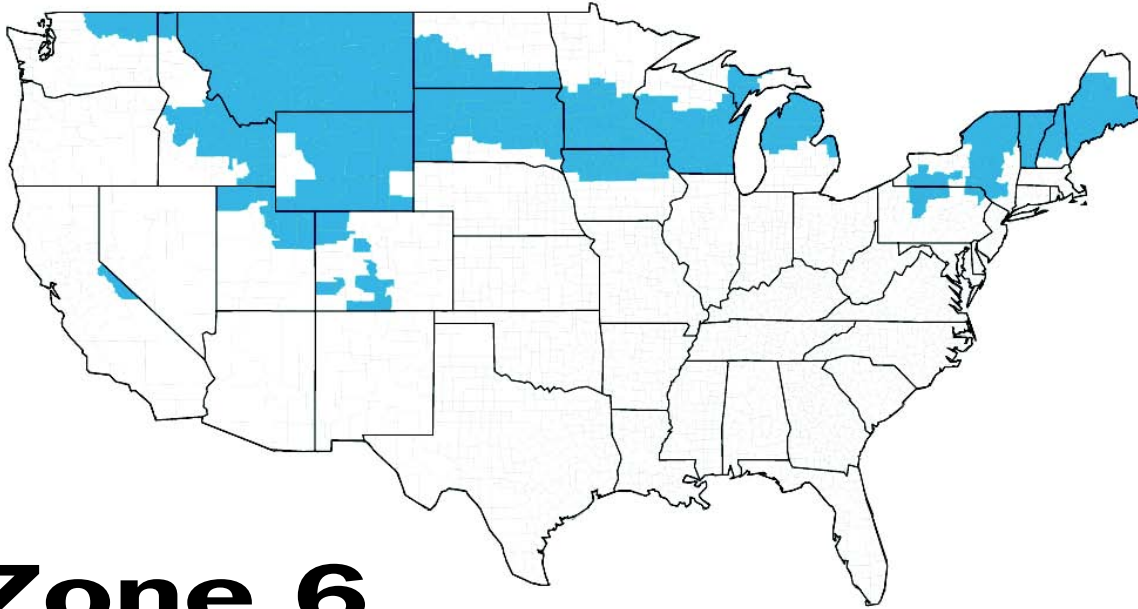


Climate Zone 5 Recommendation Table for Small Retail Buildings

	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-7.5 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	R-10 for 24 in.	EN13, 17, 19-21	
		Heated	R-10 full slab	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)	0.36	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 Lighting	Façade and externally illuminated signage lighting	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)			90% 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 6

California

Alpine
Mono

Colorado

Alamosa
Archuleta
Chaffee
Conejos
Costilla
Custer
Dolores
Eagle
Moffat
Ouray
Rio Blanco
Saguache
San Miguel

Idaho

Adams
Bannock
Bear Lake
Bingham
Blaine
Boise
Bonner
Bonneville
Boundary
Butte
Camas
Caribou
Clark
Custer
Franklin
Fremont
Jefferson
Lemhi
Madison
Oneida
Teton
Valley

Iowa

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
Ida
Kossuth
Lyon
Mitchell
O'Brien
Osceola
Palo Alto
Plymouth
Pocahontas
Sac
Sioux
Webster
Winnebago
Winneshiek
Worth
Wright

Maine

All counties
except:
Aroostook

Michigan

Alcona
Alger

Alpena
Antrim
Arenac
Benzie
Charlevoix
Cheboygan
Clare
Crawford
Delta
Dickinson
Emmet
Gladwin
Grand Traverse
Huron
Iosco
Isabella
Kalkaska
Lake
Leelanau
Manistee
Marquette
Mason
Mecosta
Menominee
Missaukee
Montmorency
Newaygo
Oceana
Ogemaw
Osceola
Oscoda
Otsego
Presque Isle
Roscommon
Sanilac
Wexford

Minnesota

Anoka
Benton
Big Stone
Blue Earth
Brown
Carver
Chippewa
Chisago
Cottonwood
Dakota

Dodge
Douglas
Faribault
Fillmore
Freeborn
Goodhue
Hennepin
Houston
Isanti
Jackson
Kandiyohi
Lac qui Parle
Le Sueur
Lincoln
Lyon
Martin
McLeod
Meeker
Morrison
Mower
Murray
Nicollet
Nobles
Olmsted
Pipestone
Pope
Ramsey
Redwood
Renville
Rice
Rock
Scott
Sherburne
Sibley
Stearns
Steele
Stevens
Swift
Todd
Traverse
Wabasha
Waseca
Washington
Watonwan
Winona
Wright
Yellow Medicine

Montana

All counties

New Hampshire

Belknap
Carroll
Coos
Grafton
Merrimack
Sullivan

New York

Allegany
Broome
Cattaraugus
Chenango
Clinton
Delaware
Essex
Franklin
Fulton
Hamilton
Herkimer
Jefferson
Lewis
Madison
Montgomery
Oneida
Otsego
Schoharie
Schuyler
Steuben
St. Lawrence
Sullivan
Tompkins
Ulster
Warren
Wyoming

North Dakota

Adams
Billings
Bowman
Burleigh
Dickey
Dunn

Emmons
Golden Valley
Grant
Hettinger
LaMoure
Logan
McIntosh
McKenzie
Mercer
Morton
Oliver
Ransom
Richland
Sargent
Sioux
Slope
Stark

Pennsylvania

Cameron
Clearfield
Elk
McKean
Potter
Susquehanna
Tioga
Wayne

South Dakota

All counties
except:
Bennett
Bon Homme
Charles Mix
Clay
Douglas
Gregory
Hutchinson
Jackson
Mellette
Todd
Tripp
Union
Yankton

Utah

Box Elder
Cache

Carbon
Daggett
Duchesne
Morgan
Rich
Summit
Uintah
Wasatch

Vermont

All counties

Washington

Ferry
Okanogan
Pend Oreille
Stevens

Wisconsin

All counties
except:
Ashland
Bayfield
Burnett
Douglas
Florence
Forest
Iron
Langlade
Lincoln
Oneida
Price
Sawyer
Taylor
Vilas
Washburn

Wyoming

All counties
except:
Goshen
Platte
Lincoln
Sublette
Teton