CHAPTER 3 [CE]

GENERAL REQUIREMENTS

SECTION C301
CLIMATE ZONES

C301.1 General. Climate zones from Table C301.1 shall be used in determining the applicable requirements from Chapter 4. Seattle is in Zone 4-C (4-Marine).

TABLE C301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE AND COUNTY

Key: A — Moist, B — Dry, C — Marine. Absence of moisture designation indicates moisture regime is irrelevant.	
WASHINGTON	
5B Adams	4C Lewis
5B Asotin	5B Lincoln
5B Benton	4C Mason
5B Chelan	5B Okanogan
4C Clallam	4C Pacific
4C Clark	5B Pend Oreille
5B Columbia	4C Pierce
4C Cowlitz	4C San Juan
5B Douglas	4C Skagit
5B Ferry	5B Skamania
5B Franklin	4C Snohomish
5B Garfield	5B Spokane
5B Grant	5B Stevens
4C Grays Harbor	4C Thurston
4C Island	4C Wahkiakum
4C Jefferson	5B Walla Walla
4C King	4C Whatcom
4C Kitsap	5B Whitman
5B Kittitas	5B Yakima
5B Klickitat	

SECTION C302
DESIGN CONDITIONS

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

C302.2 Exterior design conditions. The heating or cooling outdoor design temperatures shall be ((~~selected from Appendix C.~~)) 24°F (-4.4°C) for heating and 82°F (27.8°C) dry bulb and 66°F (18.9°C) wet bulb for cooling.

SECTION C303
MATERIALS, SYSTEMS AND EQUIPMENT

C303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

C303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be listed on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be listed on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

C303.1.1.1 Blown or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be listed on certification provided by the insulation installer.

C303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

C303.1.3 Fenestration product rating. *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1), C303.1.3(2) or C303.1.3(4). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3).

Exception: Units without NFRC ratings produced by a *small business* may be assigned default *U*-factors from Table C303.1.3(5) for vertical fenestration.

TABLE C303.1.3(1)
DEFAULT GLAZED FENESTRATION *U*-FACTOR

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT
Metal	1.20	0.80	See Table C303.1.3(4)
Metal with Thermal Break[a]	1.10	0.65	
Nonmetal or Metal Clad	0.95	0.55	
Glazed Block	0.60		

For SI: 1 inch = 25.4 mm.

a. Metal Thermal Break = A metal thermal break framed window shall incorporate the following minimum design characteristics:
   1. The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/°F;
   2. The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and
   3. All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in Item Nos. 1 and 2 above.

C303.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of h × ft^2 × °F/Btu at a mean temperature of 75°F (24°C).

C303.2 Installation. All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the *International Building Code* or *International Residential Code*, as applicable.

C303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawlspace walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (153 mm) below grade.

C303.3 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

TABLE C303.1.3(2)
DEFAULT DOOR U-FACTORS

See Appendix A, Section A107.

TABLE C303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.4	0.4	0.4	0.4	0.4
VT	0.6	0.3	0.6	0.3	0.6

TABLE C303.1.3(4)
DEFAULT *U*-FACTORS FOR SKYLIGHTS[a, b, c, d]

FENESTRATION TYPE	FRAME TYPE			
	Aluminum Without Thermal Break	Aluminum With Thermal Break	Reinforced Vinyl/ Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/ Vinyl without Reinforcing
Single Glazing				
Glass	U-1.58	U-1.51	U-1.40	U-1.18
Acrylic/polycarb	U-1.52	U-1.45	U-1.34	U-1.11
Double Glazing				
Air	U-1.05	U-0.89	U-0.84	U-0.67
Argon	U-1.02	U-0.86	U-0.80	U-0.64
Double Glazing, $e = 0.20$				
Air	U-0.96	U-0.80	U-0.75	U-0.59
Argon	U-0.91	U-0.75	U-0.70	U-0.54
Double Glazing, $e = 0.10$				
Air	U-0.94	U-0.79	U-0.74	U-0.58
Argon	U-0.89	U-0.73	U-0.68	U-0.52
Double Glazing, $e = 0.05$				
Air	U-0.93	U-0.78	U-0.73	U-0.56
Argon	U-0.87	U-0.71	U-0.66	U-0.50
Triple Glazing				
Air	U-0.90	U-0.70	U-0.67	U-0.51
Argon	U-0.87	U-0.69	U-0.64	U-0.48
Triple Glazing, $e = 0.20$				
Air	U-0.86	U-0.68	U-0.63	U-0.47
Argon	U-0.82	U-0.63	U-0.59	U-0.43
Triple Glazing, $e = 0.20$ on 2 surfaces				
Air	U-0.82	U-0.64	U-0.60	U-0.44
Argon	U-0.79	U-0.60	U-0.56	U-0.40
Triple Glazing, $e = 0.10$ on 2 surfaces				
Air	U-0.81	U-0.62	U-0.58	U-0.42
Argon	U-0.77	U-0.58	U-0.54	U-0.38
Quadruple Glazing, $e = 0.10$ on 2 surfaces				
Air	U-0.78	U-0.59	U-0.55	U-0.39
Argon	U-0.74	U-0.56	U-0.52	U-0.36
Krypton	U-0.70	U-0.52	U-0.48	U-0.32

a. *U*-factors are applicable to both glass and plastic, flat and domed units, all spacers and gaps.
b. Emissivities shall be less than or equal to the value specified.
c. Gap fill shall be assumed to be air unless there is a minimum of 90 percent argon or krypton.
d. Aluminum frame with thermal break is as defined in Note a to Table C303.1.3(1).

TABLE C303.1.3(5)
SMALL BUSINESS COMPLIANCE TABLE DEFAULT U-FACTORS FOR VERTICAL FENESTRATION

VERTICAL FENESTRATION DESCRIPTION				FRAME TYPE		
Panes	Low-*e*[a]	Spacer	Fill	Any Frame	Aluminum Thermal Break[b]	Wood/Vinyl/ Fiberglass
Double[c]	A	Any	Argon	0.48	0.41	0.32
	B	Any	Argon	0.46	0.39	0.30
	C	Any	Argon	0.44	0.37	0.28
	C	High Performance	Argon	0.42	0.35	Deemed to comply[e]
Triple[d]	A	Any	Air	0.50	0.44	0.26
	B	Any	Air	0.45	0.39	0.22
	C	Any	Air	0.41	0.34	0.20
	Any double low-*e*	Any	Air	0.35	0.32	0.18

For SI: 1 inch = 25.4 mm.

a. Low-*e*A (emissivity) shall be 0.24 to 0.16.
Low-*e*B (emissivity) shall be 0.15 to 0.08.
Low-*e*C (emissivity) shall be 0.07 or less.

b. Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:
1. The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/°F;
2. The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and
3. All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in Item Nos. 1 and 2.

c. A minimum air space of 0.375 inches between panes of glass is required for double glazing.

d. A minimum air space of 0.25 inches between panes of glass is required for triple glazing.

e. Deemed to comply glazing shall not be used for performance compliance.