

CR 83-68

RULES CERTIFICATE

STATE OF WISCONSIN)
) SS
DEPT. OF INDUSTRY,)
LABOR & HUMAN RELATIONS)

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Howard S. Bellman, Secretary of the Department of Industry, Labor and Human Relations, and custodian of the official records of said department, do hereby certify that the annexed rule(s) relating to Chs Ind 50-64 - Bldg & Htg, Vent & A/C Code - Light Transmitting Plastics and Greenhouses were duly approved and adopted by this department on 11/14/83.
(Subject) (Date)

I further certify that said copy has been compared by me with the original on file in this department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the department at 8:00 a.m. in the city of Madison, this 14th day of November A.D. 19 83.

Howard S. Bellman
Secretary

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NOV 15 1983
8:15 a.m.
Revisor of Statutes
Bureau

ORDER OF ADOPTION

Pursuant to authority vested in the Department of Industry, Labor and Human Relations by section(s) 101.02(1), 101.02(15)(h)-(j), Stats., the Department of Industry, Labor and Human Relations hereby creates; amends; repeals and recreates; and repeals and adopts rules of Wisconsin Administrative Code chapter(s):

Ind. 50-64 Building & Heating, Ventilating & Air Conditioning Code
(Number) Light Transmitting Plastics and Greenhouses
(Title)

The attached rules shall take effect on the first day of the month following
publication in the Wisconsin Administrative Register, pursuant to section
227.026, Stats.

Adopted at Madison, Wisconsin, this 14th
day of November, A.D., 1983

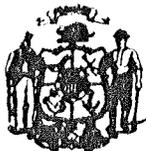
DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

Howard S. Bellman
Secretary

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RULES in FINAL DRAFT FORM

Rule: Chs. Ind 50-64 (Ind 51.065 and Ind 62, Subch. VI)

Relating to: Building & Heating, Ventilating & Air Conditioning
Code - Light Transmitting Plastics & Greenhouses

Clearinghouse Rule No.: 83-68

Administrative rules to repeal ss. Ind 51.02 (6), 51.03 (5) (h), 51.03 (6) (a) 3.; to renumber s. Ind 51.01 (120a); to amend ss. Ind 50.02, 51.02 (20), 51.25 (47); to repeal and recreate ss. Ind 51.01 (13), 53.11 (4) (a); to create ss. Ind 51.01 (120a), 51.065, 51.25 (43a), 51.25 (45a), 51.25 (45b), 62.10 (1m), ch. Ind 62, subch. VI relating to light transmitting plastics and greenhouses.

ANALYSIS OF RULES

The proposed rules establish requirements for the use of light transmitting plastics in the construction of public buildings and places of employment. The proposal includes definitions, material standards and qualifications and permitted uses. Light transmitting plastics may be used as glazing, in exterior wall panels, roof panels, skylights, light diffusing systems and exterior veneer. The proposal establishes the maximum amount of light transmitting plastic to be used per component and in the building as well as requirements for the separation between components of light transmitting plastics. Nationally recognized test standards for light transmitting plastics are adopted by reference.

The proposal also establishes comprehensive requirements for greenhouses. Greenhouses are classified as production or teaching/mercantile. The proposal addresses construction, separations, set-back, height and area limitations, exiting and design loads.

The proposed rules were developed in conjunction with the Light Transmitting Plastic Sub-Committee of the Project Committee for Plastics in Construction and the Building Code Advisory Review Board. The following is a list of the members of the sub-committee and the Review Board:

Light Transmitting Plastics Sub-Committee

- Bruce D. Anson, Rohm and Haas Company
- Donald Grieb, Donald Grieb Associates
- W. Lawrence Hall, General Electric Corporation
- Roger Hertel, IBG International
- Bruce Keller, Kalwall Corporation
- Steven Villand, Lake City Glass and Paint Company

Building Code Advisory Review Board

- Sharyl Bisgard, League of Women Voters
- Ronald W. Chiapete, Wisconsin State Fire Chiefs Association
- Victor Halloran, Wisconsin Society of Architects/AIA
- Lee C. Jensen, City of Milwaukee
- James E. Knothe, Wisconsin Society of Professional Engineers
- Marshall Kuhnly, Wisconsin State AFL-CIO
- Michael G. Laskis, State Bar of Wisconsin
- Thomas Lorenz, Master Builders Association of Wisconsin, Inc.
- George J. Mark, Wisconsin Builders Association
- Donald Roth, League of Wisconsin Municipalities
- David J. Schield, Wisconsin Association of Manufacturers and Commerce
- Stephen D. Schlough, Wisconsin Department of Health and Social Services
- Richard C. Schumacher, Wisconsin Chapter, Associated General Contractors of America, Inc.
- William Shea, Building Owners and Manufacturers Association/Income Property Owners Association
- Jahn Tinglum, Wisconsin Department of Public Instruction
- Fred Wegener, Wisconsin Department of Administration, Division of State Facilities Management
- Larry J. Wills, Wisconsin Chapter, Society of Fire Protection Engineers

* * * * *

Pursuant to the authority vested in the state of Wisconsin's Department of Industry, Labor and Human Relations by ss. 101.02 (1) and 101.02 (15) (h) to (j), Stats., the department hereby repeals, amends, repeals and recreates and creates rules interpreting ss. 101.02 (15) (h) to (j), Stats., as follows:

SECTION 1. Ind 50.02 is amended to read:

Ind 50.02 SCOPE OF CHAPTERS. The provisions of chs. Ind 50-64 apply to all public buildings and places of employment. ~~The term "building or structure" as used in these chapters shall mean public building or place of employment.~~ The provisions of these chapters are not retroactive unless specifically stated in the administrative rule. Where different sections of these chapters specify different requirements, the most restrictive requirement shall govern, except as specified in ss. Ind 51.02 (11) (b) 4., 58.001 (2) (c), 62.93 and 64.57 (3). ~~The Appendix provides explanatory material related to specific requirements.~~

Note #1: For a definition of "public building" and "place of employment", see ss. Ind 51.01 ~~(102a)~~ (102b) and 51.01 (104a) or s. ~~401.01 (1)~~ 101.01 (2), Stats.

Note #2: The appendix provides explanatory material related to specific requirements.

SECTION 2. Ind 51.01 (13) is repealed and recreated to read:

Ind 51.01 (13) "Building or structure" means public building or place of employment.

SECTION 3. Ind 51.01 (120a) is renumbered (120b).

SECTION 4. Ind 51.01 (120a) is created to read:

Ind 51.01 (120a) "Spandrel" means that portion of wall filling the space between the top of a window in one story and the sill of the window in the story above.

SECTION 5. Ind 51.02 (6) is repealed.

SECTION 6. Ind 51.02 (20) is amended to read:

Ind 51.02 (20) CLASS OF CONSTRUCTION SEPARATION. (a) Except as provided in par. (b) and s. Ind 62.93, portions of buildings of different classes of construction, as specified in s. Ind 51.03, shall be separated by fire division walls as specified in s. Ind 51.02 (13) or the building classification will be reduced to the lowest class of construction utilized.

(b) Portions of health care facilities of different classes of construction, as specified in s. Ind 51.03, shall be separated by 2-hour rated fire resistive construction as specified in s. Ind 51.04 to 51.049 or the building classification shall be reduced to the lowest class of construction utilized.

SECTION 7. Ind 51.03 (5) (h) is repealed.

SECTION 8. Ind 51.03 (6) (a) 3. is repealed.

SECTION 9. Ind 51.065 is created to read:

Ind 51.065 LIGHT-TRANSMITTING PLASTICS. (1) SCOPE. (a) The requirements of this section shall apply to the quality and methods of application of plastics for use as light-transmitting materials in buildings and structures. When used as interior finish, plastic materials shall meet the requirements of s. Ind 51.07.

(b) 1. Approved light-transmitting plastic shall meet one of the following combustibility classifications:

a. CC 1 - Plastic materials which have a burning extent of one inch per minute or less when tested in nominal .060 inch thickness or in the thickness intended for use by ASTM D 635-81, Test for Flammability of Self-Supporting Plastics; or

b. CC 2 - Plastic materials which have a burning rate of 2.5 inches per minute or less when tested in nominal .060 inch thickness or in the thickness intended for use by ASTM D 635-81, Test for Flammability of Self-Supporting Plastics.

2. Light-transmitting plastic materials may be of any class as defined by this section. Before any light-transmitting plastic material may be approved for use, the manufacturer shall file with the department technical data which relates to the proposed use of the material. The data shall include the pertinent physical, mechanical and thermal properties, such as but not limited to weather resistance, expansion coefficient and combustibility characteristics. The department shall determine the adequacy of the data. Where the department determines that the material is satisfactory for the intended use, approval of the material shall be granted subject to the limitations specified in this section.

Note: See s. Ind 50.19 for additional information.

(c) All light-transmitting plastic materials approved for use under this section or s. Ind 50.19 shall be identified by the trade formula, number or name.

(2) DEFINITIONS. For the purpose of this section, the following definitions shall apply. (a) "Approved light-transmitting plastic" means a single layer or multi-layer composite consisting of thermoplastic, thermosetting or reinforced plastic material which has a self-ignition temperature 650° F. or greater when tested in accordance with Standard Method of Test for Ignition Properties of Plastics, ASTM D 1929-77, a smoke density rating no greater than 450 when tested in accordance with Standard Method of Test for Surface Burning Characteristics of Building Materials, ASTM E 84-81a in the way intended for use, or a smoke density rating no greater than 75 when tested in the thickness intended for use by Standard Method for Measuring the Density of Smoke from the Burning or Decomposition of Plastics, ASTM D 2843-77. Multi-layer composite material shall comply as a composite in the configuration intended for use.

(b) "Glass fiber reinforced plastic" means plastic reinforced with glass fiber having not less than 20% of glass fibers by weight.

(c) "Interior secondary glazing system" means construction consisting of a glazed panel of approved light transmitting plastic positioned on the interior side of a primary window set in an exterior wall which is designed primarily to control energy losses through exterior windows or glazed panels and is not intended for use as primary or exterior windows.

(d) "Light diffusing system" means a suspended construction consisting in whole or in part of lenses, panels, grids or baffles suspended below independently mounted electrical lighting sources.

(e) "Plastic glazing" means single glazing plastic materials which are glazed or set in a frame or sash and not held by mechanical fasteners which pass through the glazing material.

(f) "Plastic roof panels" means single glazing plastic materials which are fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in the plane of the roof.

(g) "Plastic wall panels" means single glazing plastic materials which are fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in exterior walls.

(h) "Thermoplastic material" means a plastic material which is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

(i) "Thermosetting material" means a plastic material which is capable of being changed into a substantially non-reformable product when cured.

(3) GLAZING OF UNPROTECTED OPENINGS. (a) General. Doors, sash and openings which are not required to be protected with fire window or glass block assemblies may be glazed with approved light-transmitting plastic in the following occupancies:

Note: See Table 51.03-B for additional requirements pertaining to windows and wall openings.

1. Schools and Other Places of Instruction under ch. Ind 56;

2. Residential Occupancies under ch. Ind 57; and

3. All other occupancies under chs. Ind 54, 55, 58, 59, 60, 61 and 62, subject to the following requirements:

a. Except as provided in par. (b), the area of such light-transmitting plastic glazing may not exceed 25 percent of the wall face of the story in which it is installed;

b. Except as provided in par. (b) 2., the area of a pane of light-transmitting plastic glazing installed above the first story shall not exceed 16 square feet where the vertical dimension of a pane may not exceed 4 feet and there shall be a spandrel constructed of materials meeting the requirements for exterior walls of s. Ind 51.03 and Table 51.03-A for the class of construction utilized between stories measuring a minimum of 3 feet in the vertical dimension;

c. Except as provided in par. (b) 2., approved light-transmitting plastics shall not be installed more than 75 feet above grade level;

d. Combinations of light-transmitting plastic glazing and light-transmitting plastic wall panels shall be subject to the area, height and percentage limitations and separation requirements applicable to the class of plastics as specified in sub. (4).

(b) Exceptions. 1. Approved light-transmitting plastic glazing may be installed in areas up to 50 percent of the wall area of each story in structures less than 75 feet in height which are provided on each floor above the first floor with fire canopies projecting at least 3 feet from the surface of the wall and extending at least 3 feet horizontally beyond the edge of the opening above, or equivalent. The size and dimension requirements specified in par. (a) 3. b. shall not apply.

2. Where an approved automatic fire sprinkler system is provided, the permissible area of light-transmitting plastic glazing permitted by par. (a) 3. a. may be increased to a maximum of 50 percent of the wall face of the story in which the glazing is installed and shall be exempt from the requirements specified in par. (a) 3. b. and c.

(4) EXTERIOR WALL PANELS. (a) General. Subject to requirements specified in par. (b), approved light-transmitting plastics may be used as wall panels in exterior walls not requiring a fire resistive rating in all occupancies except the following:

1. Theaters and Assembly Halls under ch. Ind 55;
2. Health Care, Correctional and Detention Facilities under ch. Ind 58; and
3. All high hazard occupancies.

(b) Area and Separation Limitations. 1. Except as provided in par. (c), area limitation and separation requirements of exterior light-transmitting plastic wall panels shall be as specified in Table 51.065-1.

2. Vertical spandrel wall separation constructed of materials meeting the requirements for exterior walls of s. Ind 51.03 and Table 51.03-A for the class of construction utilized between stories shall be:

- a. Three feet for CC 1 plastic wall panels; or
- b. Four feet for CC 2 plastic wall panels.

TABLE 51.065-1
 AREA LIMITATION AND SEPARATION
 REQUIREMENTS FOR LIGHT-TRANSMITTING PLASTIC WALL PANELS*

Set-Back Distance to Property Line or Other Walls on Same Property	Class of Plastic	Maximum % Area of Exterior Walls in Plastic Panels	Maximum Single Area (Square Feet)	Minimum Separation of Panels (Feet)	
				Vertical	Horizontal
5 feet or less	--	NP	NP	--	--
5 feet or more but less than 10 feet	CC 1	10	50	8	4
	CC 2	NP	NP	--	--
10 feet or more but less than 30 feet	CC 1	25	90	6	4
	CC 2	15	70	8	4
Over 30 feet	CC 1	50	Not limited	3	0
	CC 2	25	100	6	3

N.P. means not permitted

*The requirements of this Table do not apply to greenhouses. See ch. Ind 62, subch. VI.

(c) Exceptions. 1. In structures which are provided on any floor above the first with continuous horizontal projections extending at least 36 inches from the surface of the wall in which light-transmitting plastic wall panels are installed, there need be no vertical separation at that floor except that provided by the vertical thickness of the projection.

2. Where an approved automatic fire sprinkler system is provided in the building, the maximum percent area of light-transmitting plastic panels in the exterior wall and the maximum square feet of single area given in Table 51.065-1 may be increased 100 percent but in no case may the area of light-transmitting plastic wall panels exceed 50 percent of the wall area.

(5) ROOF PANELS. (a) General. Except in chs. Ind 55 and 58 occupancies and high hazard occupancies, approved light-transmitting plastic roof panels may be installed as follows, subject to the requirements specified in par. (b):

1. In roofs of buildings protected by an approved automatic fire sprinkler system;

2. Where the roof is not required to have a fire resistance rating; or

3. Where the light-transmitting plastic roof panels meet the requirements for roof coverings of the appropriate class of construction.

Note: See s. A52.015 for additional information regarding high hazard occupancies.

(b) Limitations. Except as provided in par. (c), the use of light transmitting plastic roof panels shall be limited as follows:

1. Individual light-transmitting plastic roof panels or units shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane.

2. Where exterior wall openings are required to be protected, no light-transmitting plastic roof panels or units may be installed within 8 feet of such exterior wall.

3. Light-transmitting plastic roof panels or units shall be limited in area and the aggregate area of panels shall be limited by a percentage of the floor area of the room or space sheltered in accordance with Table 51.065-2.

Table 51.065-2*
AREA LIMITATIONS FOR
LIGHT-TRANSMITTING PLASTIC ROOF PANELS AND SKYLIGHTS

Class of Plastic	Maximum Area Individual Unit or Panel (sq. ft.)	Maximum Aggregate Area (% of Floor Area)
CC 1	300	30
CC 2	100	25

*The requirements of this table do not apply to greenhouses. See ch. Ind 62, subch. VI.

(c) Exceptions. 1. One-story buildings not more than 16 feet in height and not exceeding 1200 square feet in area and not closer than 10 feet to another building are exempt from the limitations specified in par. (b).

2. Low-hazard use areas such as swimming pool shelters and similar structures, are exempt from the area limitations specified in par. (b) provided they do not exceed 5,000 square feet in projected floor area and are not closer than 10 feet to the property line or adjacent buildings.

Note: See s. A52.015 for additional information regarding low hazard occupancies.

(6) SKYLIGHTS. (a) General. Subject to the requirements of par. (b), skylight assemblies may be glazed with approved light-transmitting plastic in all but high hazard occupancies.

Note: See s. A52.015 for additional information regarding high hazard occupancies.

(b) Limitations. Except as provided in par. (c), the use of skylights with approved light-transmitting plastic glazing shall be limited as follows:

1. The light-transmitting plastic shall be mounted at least 4 inches above the plane of the roof on a curb construction consistent with that required for the class of construction of the building;

2. Dome-shaped skylights shall rise above the mounting flange a minimum distance equal to 10 percent of the maximum span of the dome but not less than 5 inches;

3. The edges of the light-transmitting plastic skylights or dome shall be protected by metal or noncombustible material;

4. Each skylight unit of CC 1 material may have a maximum of 300 square feet within the curb and each skylight unit of CC 2 material may have a maximum of 100 square feet within the curb;

5. The aggregate area of skylights may not exceed 33-1/3 percent when CC 1 materials are used, and 25 percent when CC 2 materials are used, of the floor area of the room or space sheltered by the roof in which they are installed;

6. Skylights shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane; and

7. Where exterior wall openings are required to be fire protected, no skylight may be installed within 6 feet of such exterior wall.

8. Combinations of light-transmitting plastic roof panels and skylights shall be subject to the area and percentage limitations and separation requirements as specified in sub. (5) (b).

(c) Exceptions. 1. The requirements of par. (b) shall not apply if:

a. The building on which the skylights of approved light-transmitting plastic glazing are located is not more than one story in height, is located not less than 30 feet from a property line and any other building on the property, and the room or space sheltered by the skylight is not a means of egress, a ch. Ind 58 occupancy, or a high hazard occupancy; or

b. The approved light-transmitting plastic material meets the roof cover requirements for the appropriate class of construction.

2. Except in chs. Ind 55 and 58 occupancies and high hazard occupancies, the requirements specified in par. (b) 4. to 6. shall not apply to skylights with approved light-transmitting plastic glazing provided:

a. The skylight serves as a fire venting system approved by a petition for modification as specified in s. Ind 50.25; or

b. The skylight is used in a building equipped with an approved automatic fire sprinkler system.

(7) LIGHT-DIFFUSING SYSTEMS. (a) Light Diffusers. 1. Unless protected with an approved automatic fire sprinkler system, plastic light-diffusing systems may not be installed in:

a. Theaters and assembly halls under ch. Ind 55;

b. Health care, correctional and detention facilities under ch. Ind 58; and

c. High hazard occupancies.

Note: See s. A52.015 for additional information regarding high hazard occupancies.

2. Plastic light-diffuser panels shall be supported directly or indirectly from ceiling or roof construction by use of noncombustible hangers.

3. No plastic light-diffusing system may be installed in areas required to be equipped with automatic sprinklers unless appropriate tests by a recognized laboratory have shown that such system does not prevent effective operation of the sprinklers or unless sprinklers are located both above and below the light-diffusing system to give effective sprinkler protection.

4. Approved plastic materials for light-diffusing systems shall comply with s. Ind 51.07 unless the plastic panels comply with the following:

a. Fall from their mounting at an ambient temperature of at least 200° F. below the self-ignition temperature of the plastic material as measured by ASTM D 1929-77;

b. Remain in place at an ambient room temperature of 175° F. for a period of not less than 15 minutes; and

c. The maximum length of any single plastic panel does not exceed 10 feet and the maximum area of any single light diffuser does not exceed 30 square feet.

(b) Electrical Lighting Fixtures. Plastic light-transmitting panels and light-diffuser panels installed in approved electrical lighting fixtures shall comply with the requirements specified in par. (a) 4. a. to c.

(8) EXTERIOR VENEER. Approved light-transmitting plastic material may be installed as an exterior veneer for any building, provided:

(a) The plastic veneer may not be attached to any exterior wall to a height greater than 35 feet above grade;

(b) Sections of plastic veneer may not exceed 200 square feet in area; and

(c) Sections of plastic veneer shall be separated by a minimum of 4 feet vertically.

(9) INTERIOR SECONDARY GLAZING SYSTEMS. (a) Light-transmitting plastic materials used in interior secondary glazing systems shall comply with the requirements of s. Ind 51.07 unless the approved plastic used in the interior secondary glazing system meets the following requirements:

1. The approved plastic used as the glazing falls from its mounting either with or without its frame or sash at an ambient temperature of at least 200° F. below the self-ignition temperature of the plastic material as measured by ASTM D 1929-77;

2. Interior secondary glazing systems is not installed over windows required for egress unless approved tests have shown that the system does not interfere with egress from the window; and

3. The maximum length of any single plastic panel does not exceed 10 feet and the maximum area of any single panel does not exceed 30 square feet.

SECTION 10. Ind 51.25 (43a) is created to read:

Ind 51.25 (43a) RATE OF BURNING AND/OR EXTENT AND TIME OF BURNING OF SELF-SUPPORTING PLASTICS IN A HORIZONTAL POSITION. ASTM Designation D635-81.

SECTION 11. Ind 51.25 (45a) is created to read:

Ind 51.25 (45a) IGNITION PROPERTIES OF PLASTICS. ASTM Designation D1929-77.

SECTION 12. Ind 51.25 (45b) is created to read:

Ind 51.25 (45b) DENSITY OF SMOKE FROM THE BURNING OR DECOMPOSITION OF PLASTICS. ASTM Designation D2843-77.

SECTION 13. Ind 51.25 (47) is amended to read:

Ind 51.25 (47) TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS. ASTM Designation ~~E84-80~~ E84-81a.

SECTION 14. Ind 53.11 (4) (a) is repealed and recreated to read:

Ind 53.11 (4) (a) 1. Except as provided in subd. 2., full load as indicated in the zone map for roof loads distributed over the entire area. The loads shall be applied to the horizontal projection of the roof.

2. a. Roofs, except of greenhouses, with an unobstructed slippery surface such as glass, plastic, metal, slate or similar material that will allow snow to slide off the eaves and having a slope (α) exceeding 30° , may be designed for a load determined by multiplying the roof load specified in par. (a) (intro), by a slope factor (C_R) using the following formula:

$$C_R = 1.0 - \frac{\alpha - 30^\circ}{40^\circ}$$

b. Roofs of greenhouses shall comply with the requirements of s. Ind 62.96.

SECTION 15. Ind 62.10 (1m) is created to read:

Ind 62.10 (1m) "Greenhouses" means structures clad with light-transmitting material designed primarily for the purpose of cultivating plant life and used as public buildings or places of employment.

SECTION 16. Ch. Ind 62 Subchapter VI is created to read:

SUBCHAPTER VI - GREENHOUSES

Ind 62.90 SCOPE. (1) GENERAL. The requirements of this subchapter shall apply to all permanent greenhouses, including free standing, attached and lean-to greenhouses.

Note: See s. Ind 62.10 (4) for definition of term "permanent".

(2) LIMITATIONS. The requirements of this subchapter do not apply to temporary greenhouses, cold frames and shade covers; solar domes; skylights; greenhouse type structures not used for cultivating plant life; and production greenhouses used as farm operations as specified in s. 102.04 (3), Stats.

Ind 62.91 CLASSIFICATIONS. Greenhouses shall be classified as production greenhouses or mercantile or teaching greenhouses as follows:

(1) PRODUCTION GREENHOUSES. Production greenhouses are used for growing plant life on a production basis or for research and public access is restricted.

(2) MERCANTILE OR TEACHING GREENHOUSES. Mercantile or teaching greenhouses are used for growing plant life for direct sale or for research, and public access for the purpose of viewing or purchasing the various products is permitted.

Note: Examples of mercantile or teaching greenhouses include but are not limited to nursery greenhouses and greenhouses used by colleges or universities for teaching purposes.

Ind 62.92 CONSTRUCTION. (1) FRAME. Greenhouse frames shall be constructed of concrete, corrosive-resistant metals, heavy timber or fire-retardant treated wood or other approved materials.

(2) LIGHT-TRANSMITTING PANEL. Greenhouse roof coverings, exterior walls or interior partitions of glass or approved light-transmitting plastic glazing materials having a minimum CC 2 rating as specified in s. Ind 51.065 (1) (b) 1. may be used without limitation.

Ind 62.93 SEPARATIONS. (1) NONCOMBUSTIBLE CONSTRUCTION. Greenhouses of noncombustible construction need not be separated from any other occupancy or from any building of a different class of construction.

(2) COMBUSTIBLE CONSTRUCTION. (a) Greenhouses of combustible construction shall be separated from any other occupancy or from all buildings of a different class of construction by at least 2-hour fire rated construction as specified in ss. Ind 51.04 to 51.046.

(b) All openings in the fire rated construction shall be protected by self-closing, fire-resistive doors as specified in s. Ind 51.047.

Ind 62.94 HEIGHT AND ALLOWABLE AREA. (1) HEIGHT. Greenhouses shall be of one story design only.

(2) ALLOWABLE AREA. (a) 1. Except as provided in subd. 2., the area of mercantile or teaching greenhouses and production greenhouses shall comply with the requirements of s. Ind 54.01 for the class of construction utilized.

2. The area of production greenhouses may be unlimited if the building is entirely surrounded and adjoined by public space, street or yards not less than 60 feet in width.

3. Air inflated films may be used over a greenhouse of noncombustible construction without affecting the class of construction of the greenhouse.

Note: Typical greenhouse construction satisfies either type 6 - metal frame unprotected or type 8 - wood frame unprotected construction. Type 6 construction greenhouses consist of metal or other noncombustible material framing and glass covering. Type 8 construction greenhouses consist of wood or other combustible material framing or utilize light-transmitting plastic covering.

Ind 62.95 EXITS. (1) NUMBER OF EXITS. (a) Except as provided in par. (b), every greenhouse shall have at least 2 exits.

(b) Greenhouses with 3,000 or less square feet gross floor area may have one exit.

(2) EXIT DISTRIBUTION. (a) Exits shall be distributed or located so that no part of any greenhouse will be more than 150 feet distant from an exit.

(b) Where an approved automatic fire sprinkler system is provided throughout the greenhouse, the exit distance may be up to 200 feet.

(3) TYPE OF EXITS. (a) In production greenhouses, at least one-half of the exits required by this section shall be standard exit doors to grade. The other exits may be sliding doors.

(b) In mercantile or teaching greenhouses, the required exits shall be standard exits to grade as specified in s. Ind 51.15.

Ind 62.96 DESIGN LOADS. (1) DEAD LOADS. In addition to normal dead loads as described in s. Ind 53.10, special consideration shall be given to any permanent loads such as, but not limited to, hanging baskets, planters and similar items, that are to be supported by structural members for a continuous period of 30 days or more, and the loads shall be included as part of the dead load.

(2) CONCENTRATED LOADS. (a) All roof members, such as but not limited to, purlins, rafters and truss top members, shall be capable of safely supporting a minimum concentrated live load of 100 pounds applied downward and normal to the roof surface at their midspan. In addition, each bottom chord panel point of the roof trusses shall be capable of safely supporting a minimum concentrated live load of 100 pounds.

(b) Maximum allowable deflection for structural members of greenhouses may not exceed 1/120 of span.

(3) ROOF LOADS. (a) Definitions. The following definitions apply only to the provisions of this section:

1. "Thermal resistance (R)" means a factor which measures the resistance of a material to the transmission of heat.

Note: The smaller the R value, the greater the amount of heat a material will transmit.

2. "Continuously heated single glazed greenhouse" means a single glazed greenhouse which has a constantly maintained interior temperature of at least 50° F., measured at 3 feet above the floor surface, a maintenance attendant is on duty at all times or the greenhouse is equipped with a temperature alarm system to provide warning in the event of a heating system failure and the roof material has a total thermal resistance of less than 1.0.

Note: Air inflated double film greenhouse roof materials and air inflated double film over rigid light-transmitting materials satisfy the intent of this definition.

3. "Continuously heated double glazed greenhouse" means a double glazed greenhouse which meets the requirements specified in subd. 2. except that the roof material may have a total thermal resistance of greater than 1.0, but less than 2.0.

4. "Intermittently heated or unheated greenhouse" means any greenhouse that does not meet the requirements specified in subd. 2. or 3.

(b) Roof Loads. 1. Except as specified in subd. 3., roof structural members subject to snow accumulation shall be designed for the following roof load distributions:

THERMAL CONDITION	MINIMUM ROOF LOAD
Continuously heated single glazed greenhouse	15 Pounds Per Square Foot
Continuously heated double glazed greenhouse	20 Pounds Per Square Foot
Intermittently heated or unheated greenhouse	See s. Ind 53.11 (4) (a)

2. The minimum roof loads shall be distributed over the entire area and shall be applied to the horizontal projection of the roof.

3. Free-standing, single glazed, Quonset-type greenhouses not over 4,500 square feet gross ground area shall be designed for a minimum roof load of 10 P.S.F.

(c) Heat transfer barriers. Heat transfer barriers installed in the interior of the greenhouse may be used in winter months if they are automatically or manually retractable with a 20 minute time period. Permanent heat transfer barriers may not be used.

(d) Wind Loads. Except as provided in subds. 1. and 2., greenhouses shall be designed to withstand the wind loads specified in s. Ind 53.12.

1. Greenhouses with a maximum height of 30 feet shall be designed to resist a minimum total wind load of 15 P.S.F.

2. Quonset-type greenhouses not over 15 feet in height shall be designed to resist a minimum total wind load of 10 P.S.F.

EFFECTIVE DATE

Pursuant to s. 227.026 (1) (intro), Stats., these rules shall take effect on the first day of the month following publication in the Wisconsin Administrative Register.
