

1. Record Nr.	UNINA9910877142203321
Autore	Brunetti Gian Luca
Titolo	Design and Construction of Bioclimatic Wooden Greenhouses, Volume 3 : Design of Construction: Envelopes
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2023 ©2023
ISBN	1-394-19216-9 1-394-19214-2
Descrizione fisica	1 online resource (289 pages)
Disciplina	635.9823
Soggetti	Greenhouses - Design and construction Greenhouses - Heating and ventilation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Introduction -- Chapter 1. Prolog - Overview of Types of Transparent Enclosures -- 1.1. Risks of condensation on transparent enclosures -- 1.2. Essentials on glass panel enclosures -- 1.2.1. Installation of glass panels -- 1.3. Essentials on synthetic panel enclosures -- 1.3.1. Ribbed panels -- 1.3.2. Drained flat double panels -- 1.3.3. Corrugated panels -- 1.3.4. Synthetic films -- 1.4. Curtain walls -- 1.4.1. Detailing at vertical corners -- 1.4.2. Detailing the connection between the front wall and the roof -- 1.4.3. Detailing the connection between the side walls and the roof -- 1.4.4. Detailing the connection between the roof and the building front façade in attached greenhouses -- 1.4.5. Detailing the connection between the roof and the back wall (for stand-alone greenhouses) -- 1.4.6. Detailing the transition between an opaque part of the roof and a transparent one -- 1.4.7. Detailing the vertical joints between greenhouse and building -- 1.4.8. Connecting external systems to the mullion-and-transom system -- 1.4.9. Pressure caps on roofs -- 1.4.10. Bent plates as anchoring devices -- 1.4.11. The façade of windows as an alternative to the curtain wall -- 1.4.12. The façade of windows at the lintels and at the transoms -- 1.4.13. Connection between mullion or transoms and windows by means of setbacks in the profiles -- 1.4.14. Windows and doors -- 1.5. Glazing with glass

panels -- 1.5.1. Glass -- Chapter 2. Transparent Plastic Enclosures -- 2.1. Materials for synthetic panels -- 2.1.1. Polycarbonate -- 2.1.2. Acrylic -- 2.1.3. Fiberglass -- 2.2. Commonalities between flat polycarbonate, acrylic or fiberglass panels -- 2.2.1. Working with polycarbonate sheets -- 2.2.2. Working with acrylic sheets -- 2.2.3. Working with fiberglass panels. 2.2.4. Installation of corrugated polycarbonate, acrylic or fiberglass panels -- 2.3. Installation of multi-wall polycarbonate or acrylic panels -- 2.3.1. Anchorage by direct screwing -- 2.3.2. Anchorage by means of channels -- 2.3.3. Anchorage by means of profiled connectors embedded in the joints at the edge of the panels -- 2.3.4. Anchorage by means of pressure caps in curtain-wall schemes -- 2.4. Connection of mullions and/or transoms to the transparent panels by means of pressure caps -- 2.4.1. Example of simple and low-cost openable wooden window constructions suitable for self-building -- 2.5. Further considerations related to solar shading -- 2.5.1. Shading paints -- 2.5.2. External overhangs -- 2.5.3. External Venetian blinds -- 2.5.4. External horizontal fins -- 2.5.5. Internal Venetian blinds -- 2.5.6. Internal horizontal fins -- 2.5.7. External or internal fixed skylight grids or roof grids -- 2.5.8. Detached external canvases/nets -- 2.5.9. Attached external canvases/nets/shade cloths/rollers -- 2.5.10. External curtains/rollers -- 2.5.11. Detached internal canvases -- 2.5.12. Attached internal canvases/nets/shade cloths/curtain rollers -- 2.6. Thermal insulation -- 2.6.1. Resistive insulation -- 2.6.2. Reflective insulation -- 2.6.3. Cavities -- 2.7. Movable insulation -- 2.7.1. Movable insulation panels -- 2.7.2. Removable insulation panels -- 2.7.3. Thermal blankets and curtains -- 2.8. Solar reflectors -- 2.8.1. Diffuse solar reflectors -- 2.8.2. Specular solar reflectors -- 2.8.3. Fixed solar reflectors -- 2.8.4. Movable solar reflectors -- 2.9. Mechanical systems for operating the openable frames -- 2.9.1. Mechanical system for opening rows of openings -- 2.9.2. Mechanical systems for opening single windows and skylights -- 2.9.3. Actuator control -- 2.10. Opaque envelopes -- 2.11. Thermally broken external balconies. 2.12. Paints, stains and preservatives -- Chapter 3. Film-enclosed Greenhouses -- 3.1. Characteristics of polyethylene films -- 3.2. Alternatives to polyethylene films -- 3.3. Strategies for installing the films -- 3.3.1. Fixing strategies entailing rotation -- 3.3.2. Fixing strategies not entailing rotation -- 3.4. Specific challenges in polyethylene-enclosed wooden greenhouses -- 3.4.1. Fitting the structure to avoid tearing the films -- 3.4.2. Consequences of vapor condensation in film-enclosed greenhouses -- 3.5. Multiple polyethylene film layouts -- 3.5.1. Inflated multiple envelopes -- 3.5.2. Inflated ETFE cushions -- 3.6. Film-enclosed greenhouses for hot climates -- 3.6.1. Orientation of hot-climate growing greenhouses -- 3.6.2. Solar shading for hot-climate greenhouses -- 3.6.3. Natural ventilation for hot-climate greenhouses -- 3.6.4. Construction schemes for hot-climate greenhouses, with particular reference to wood -- 3.7. Framed structural layouts adopting combinations of portal frames -- 3.8. Bamboo greenhouses -- Conclusion -- References -- Index -- Summaries of other volumes -- EULA.

Sommario/riassunto

This book is the third of four dealing with bioclimatic design and construction by focusing on the most basic and polyvalent of modern environmental systems: the bioclimatic greenhouse, the "Swiss-army chainsaw" of architecture. More specifically, this third volume focuses on how the envelope of bioclimatic wooden greenhouses may be designed and built. In more general terms, it helps us to consider how to design and build the transparent and opaque enclosures of

bioclimatic, low-energy architecture, with low environmental impact. This multi-volume book covers both free-standing greenhouses that can naturally heat and cool themselves, and lean-to greenhouses that support the natural heating and cooling of buildings; this includes both agricultural greenhouses and greenhouses suited to host people. As a result, it is a trans-disciplinary work deriving its areas of concern from a broad range of study areas, spanning from environmental, to constructional, to structural, drawing the clarity of the approach from the fact that the topics are presented by a single author with a single voice and a designer's mindset. To achieve this, the book adopts a composite set of explanatory strategies and communication registers - including extensive support by 3D construction drawings and examples - and presents not only state-of-the-art solutions, but also experimental ones.
