Graduation study

DEVELOPMENT PROTOTYPE LOW CLO CHAIR

CLIMATIC DESIGN CONSULT

CONSULTING ENGINEERS ON BUILDING PHYSICS

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PROFILE

Climatic Design Consult (CDC) is a consultant in the field of building physics and HVAC concepts. CDC advises in residential and non-residential building projects and conducts (policy founding) research on environmental and energy matters.

Climatic Design means "design adapted to local climatic conditions". The mutual tuning of building, construction, services to (local) climate, offers sustainable accommodation with optimal thermal comfort at low energy consumption. CDC strives for the integration between different disciplines in the design process and prefers design teams of which the members dare to cross the borders of their own discipline.

Photo on front-page

Climatic Design Consult advised, among other things, the conditioning concept for the renovation of Van Nelle factory. The measure unit of the facades of Van Nelle factory had been co-ordinated on the usual measure units in glass house construction, with which against low costs, because on standard measures, glass could be replaced. For removing the heat and for the air supply by means of windows to the double skin facade of the renovated Van Nelle factory, the original windows are used. These windows are provided with techniques to open windows at distance with engines to turn grips like nowadays used in glass house construction. The turn grips are connected to the initially applied technique to open the high windows.

LOW CLO CHAIR

FRAME WORK GRADUATION PROJECT

Addition of **furniture optimised on thermal comfort** to building, constructions, installations and (local) climate, to reach durable housing with optimum living and work comfort and limited energy consumption.
Low clo chairs are chairs which adds minimum extra heat insulation to clothing of person or even increases heat release.

BASIC CAUSES FOR THIS PROJECT

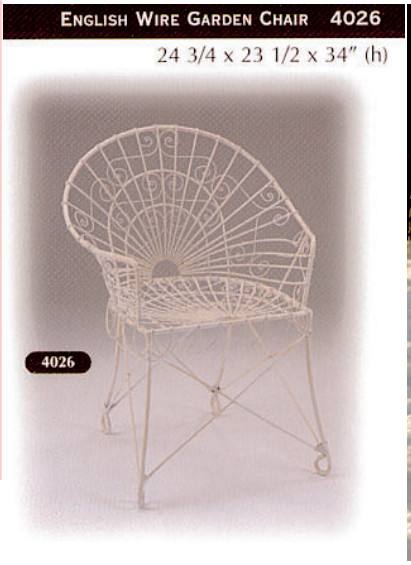
1) Design of an office building in Thailand with an optimum thermal comfort and limited energy consumption (= limited cooling needs).
2) Promote penetration of naturally ventilated buildings without comfort cooling and buildings with so-called high-temperature cooling (like embedded cooling systems) in moderate climates thanks to improved thermal comfort in the summer.

RELEVANCE

1) Kyoto-protocol.
2) Cool Biz action in Japan which tries get businessmen to cloth informal in the summer to limit energy use for cooling (See, amongst others, The Japan Times online, April 30 2005).

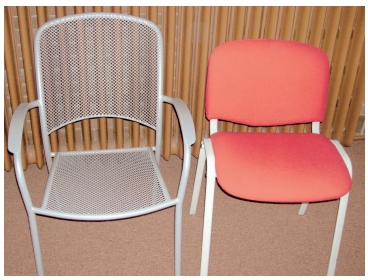
RESULT GRADUATION PROJECT

Prototype office chair optimised on cooling,
globally appreciated on thermal impact.



LOW CLO CHAIR

DESCRIPTION RESEARCH



ORIENTATION

- literature search
- orienting thermal measurements to existing characteristic chairs
- orienting study of user appreciation to existing characteristic chairs

TERMS OF REFERENCE

- Formulate terms of reference
- Standard terms of reference (a.o. ergonomics) for office chairs, possible market (segments), maximum contribution to clo value (= heat insulation), summer and winter adaptation for moderate climates?

SURVEY MATERIAL OPTIONS

- thermal aspects
- strength, stiffness, (ergonomic) comfort
- costs
- material processing / production aspects

APPRECIATION MATERIAL OPTIONS

- determination of contribution to clo value by calculations
- Selection material

CONSTRUCT PROTOTYPE

- In accordance with standard reference chair

COMPARING MEASUREMENTS

- thermal
- user appreciation