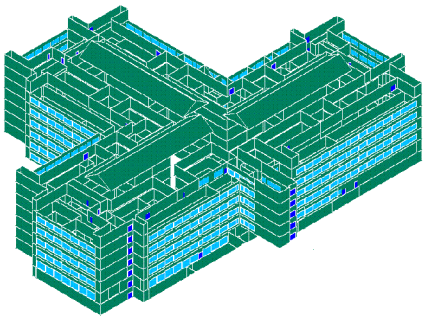
GRANLUND

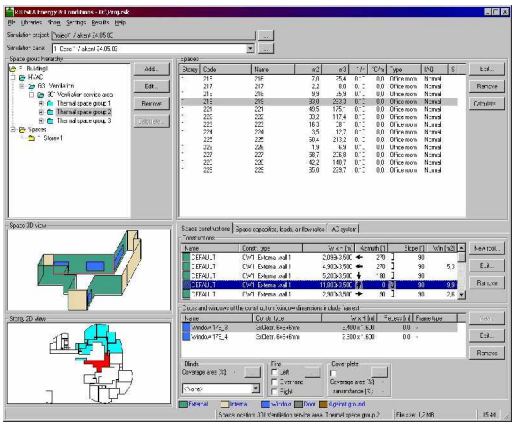
RIUSKA

Energy Simulation Tool

- for the entire Building Life Cycle



The 3D model of the building may be imported from architect's CAD data in IFC format. If it is not available, the IFC model can be produced with SMOG, a 3D modeling tool developed by Granlund.



RIUSKA makes it easy for HVAC engineers to compare a variety of design alternatives for clients and architects, and to ensure optimal indoor air conditions and energy costs

IFC™ 2x
IMPLEMENTATION
Certified in accordance with official IAI facilitated approval procedures for IFC™ 2x - 7 May 2003

GRANLUND SOFTWARE
RIUSKA

Developed for practical design

RIUSKA is a tool for the dynamic simulation of comfort and energy consumption in building services design and facilities management. It calculates inside temperatures and the heating and cooling of individual spaces, and can be used to compare and dimension HVAC systems as well as for calculating the energy consumption of whole buildings. RIUSKA also has a module to calculate the heat loss of a building in a steady-state conditions.

RIUSKA covers all the requirements of thermal performance simulation from preliminary design to facilities management and renovation. It has been developed specifically as a practical design tool for use by engineers in their everyday work.

The simulation data used by RIUSKA is saved in a special database so that it can be used for life-cycle data management.

Simulation core DOE 2.1E

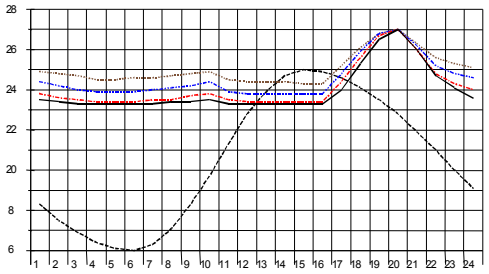
RIUSKA is developed by Granlund. The core of the software is the world-wide used DOE 2.1E simulation program. Granlund collaborates with the developer of DOE 2.1E, Lawrence Berkeley National Laboratories (LBNL). http://gundog.lbl.gov/

Building 3D model from architect

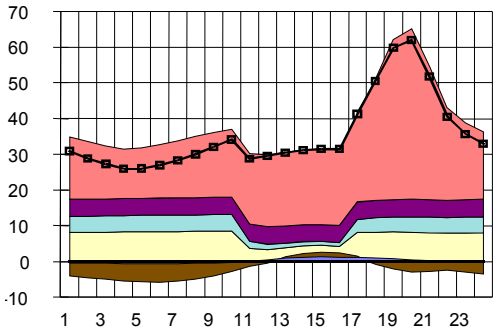
It is possible to directly transfer and reuse digital building geometry data from IFC-compliant architect software. Several architectural CAD tools (Autodesk's ADT, ArchiCAD, Nemetschek's Allplan and Visio) are already IFC compliant. RIUSKA has been officially certified by the IAI to comply with the IFC 2x, IFC 2.0 BLIS (Building Lifecycle Interoperable Software) and the IFC 1.5.1 standards.

The building geometry modeling for use in RIUSKA can be performed also by SMOG, an object-oriented 3D space modeling software program also developed by Granlund.

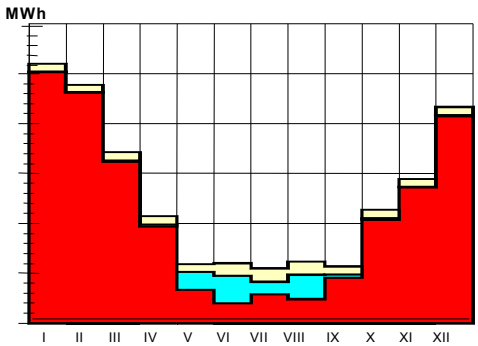
RIUSKA Simulation examples



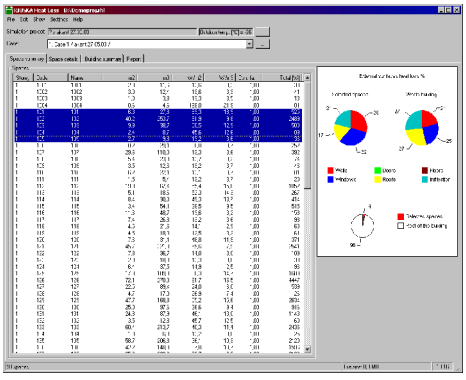
Indoor air temperature for alternative window types and shades



Thermal loads originating from windows, lighting, people, equipment, thermal conduction and air filtration



Monthly energy consumption by heating, cooling and electricity of HVAC equipment



Heat losses of the selected spaces compared to the whole building loss

Space simulation

RIUSKA simulates indoor air temperatures by hourly basis throughout the year.

Results can be used for:

- Analysis of alternative indoor air quality levels, for example comparisons between cooling and no cooling
- Comparison of alternative windows and shades
- Dimensioning of air conditioning equipment
- Analysis of temperature problems in existing facilities

System simulation

System simulation can be used when comparing and dimensioning HVAC systems.

Typical cases are:

- Comparisons between the annual energy consumption of alternative HVAC systems
- Optimisation of zones for air handling units
- Dimensioning of cooling equipment based on actual cooling loads

Building simulation

Building simulation calculates annual energy consumption for the whole building or for groups of individual spaces. RIUSKA is useful at all stages of design:

Preliminary design:

- Comparison of alternative building envelopes or windows
- Comparisons between optional indoor air quality levels
- Budgeting of energy costs
- Calculations of energy consumption for LCC analysis

Facilities management:

- Calculation of monthly energy consumption for energy monitoring in building automation or FM systems
- Calculation of energy costs for technical rent in space management

Heat loss calculations

RIUSKA Heat Loss Module calculates heat losses for each space in the building in the given outdoor temperature. Building geometry can be imported in IFC format and the calculated results can be saved back to the same IFC file.

It can be used for analyzing the heat loss distribution among walls, windows and doors. It is easy to change for example the U-values of certain window types and see the effect of that. It is also helpful, when checking the overall U-value of the building envelope.

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