

## Energy consumption of domestic refrigerator Modelling and experimentation

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### Abstract

Conclusions of last monitoring projects of energy consumption in households showed that the domestic refrigerator is the most significant consumption in electrical bill, about 25%.

The energy consumption of refrigerator is determined in laboratory using label test. However, these tests (DOE, JIS or ISO) do not reflect the real use conditions like door openings and indoor temperature and humidity of kitchen.

In one side we modeled domestic refrigerator located in the kitchen of an apartment. The equations of refrigerant have been considered in static mode and solved using EES – Engineering Equations Solver-, when equations of refrigerator compartments and the apartment are modeled in TRNSYS. Door openings and daily variation of indoor temperature have been taken in account. Indoor temperature in the kitchen is correlated to exterior temperature, building structure and occupant's practices.

In another side, we monitored two domestic refrigerator used in normal way by two families in Algiers: energy consumption, temperature and humidity inside compartments, around refrigerator, in the kitchen and refrigerant temperature have been monitored. We also, asked people about their practices and monitored energy consumption of all equipments in the houses.

If model and experimental results are close enough, this study will help for a new industrial solution and test procedure.