

THE FRENCH THERMAL REGULATION

In France, the building sector is responsible for **40% of the global energy consumption** and for 20% of greenhouse gas emissions.

The thermal regulation for buildings is part of a group of measures for tackling energy saving which impact the whole economy. These measures are consolidated within the **Climate Plan**.

There are two distinct sets of regulations for buildings:

- RT 2005 which applies to **new buildings**,
- A regulation which applies to **existing buildings** which includes specific provisions for buildings over 1000 m².

RT 2005 will be soon replaced by RT 2012, currently under preparation. This new regulation will include a yearly maximum consumption of 50 kWh/m² for new buildings (average value varying depending on the building location, its use, ...). It is planned to be applicable on January 1st, 2011 for non residential buildings and on January 1st, 2013 for all types of new buildings.

General provision:

Decree N° 2006-363 dated March 19th 2007 specifies that "*in the premises where a **cooling system** is installed, it must be activated or be kept operating only when the **inside temperature of the premises is above 26° C***".

New buildings: RT 2005

General

This regulation:

- applies to new buildings whose planning applications were submitted after September 1st, 2006,
- does not apply to buildings where normal temperature of use is $\leq 12^{\circ}\text{C}$, to swimming pools, ice rinks, breeding farms, and also to buildings which due to their final use requirements have to guarantee special temperature, hygrometry and air quality conditions.

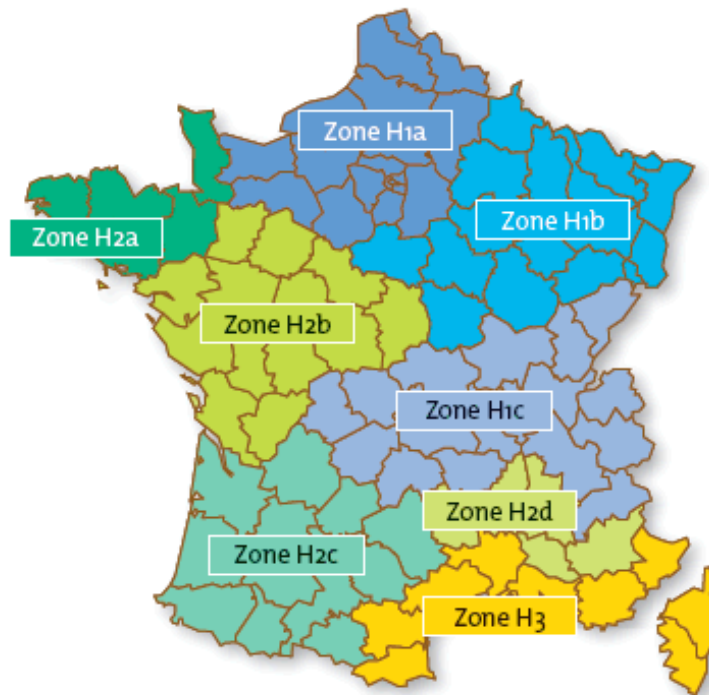
The principle of this regulation is based on the energy performance, namely the **Cep (primary energy consumption) and Tic (interior comfort temperature)** of a reference building (where the plant/machinery and other parameters are fixed), in comparison to the same values for the actual project. In addition, some equipments (windows for instance) shall not exceed some values known as « **boundary values** ».

RT2005 principle:

- $Cep \leq Cep$ "reference", and
- $Cep \leq Cep$ maximum for residential buildings, and
- $Tic \leq Tic$ "reference", and
- Respect of boundary values for some equipments.

With: Cep, primary energy consumption (kWh/m²)
Tic, interior comfort temperature (°C)

RT2005 defines 8 zones reflecting the climatic variations in France (as represented on the map below).



RT2005 Climate zones

Solar protection devices within RT 2005

As RT 2005 is based on the principle of thermal calculations realized on a complete building, solar protection is **indirectly** taken into consideration. The calculation software programme, by fixing certain parameters, will act to have the set limits attained only through the installation of solar protection devices.

Calculation parameters of the reference building promoting solar protection devices:

For the calculation of Cep "reference":

- The glazing **area** is fixed (1/6 of the living space),
- The building **exposure** is fixed (20% East, West and North, 40% South),
- The windows are **equipped with mobile devices** in such a way that the solar factor equals 0.40 when the solar protection is fully retracted and 0.15 when it is fully extended.

For the calculation of Tic "reference":

- The **area** and the **exposure** of the windows are those of the project,
- The **windows solar factor** is defined according to their exposure to noise, to their aspect and angle as well as the climate zone and altitude (the value of the reference solar factor for vertical windows is between 0.15 – vertical windows not facing North – and 0.65 – vertical windows facing North –).

Boundary values required:

In sleeping rooms, the windows **solar factor** shall be **less than or equal** to the reference solar factors (between 0.15 and 0.65).

Reference

- Decree N°2006-592 dated May 24th 2006,
- Legal decision dated May 24th 2006.

Existing buildings

General

This regulation applies when equipments are added or replaced in an existing building, except temporary buildings, low energy-consumption buildings, places of worship... It is predominantly aimed at residential and tertiary buildings.

It came into force on **November 1st, 2007**.

Solar protection devices within this regulation

In contrast to RT 2005, the thermal regulation in existing buildings is not based on a calculation (the building's parameters are unknown) but on the application of performance requirements directly to the new retrofit equipment. In this case, we speak about a regulation « by equipment ».

Abstract of requirements related to solar protection devices:

Shutters and external solar protection devices of windows and curtain walls shall be **maintained or replaced** if they already existed.

The **roof windows**, installed or replaced have to be **equipped with mobile solar protection devices** leading to a solar factor of 0.15

When a **cooling system** is installed or replaced, the glazed areas which are not North-facing **shall be fitted with solar protection devices** if this was not previously the case.

For dwellings, solar protection devices shall be mobile and shall lead to a solar factor of 0.15 or less or shall be of class 3 or 4 according to EN 14501, unless this is impossible due to town planning rules.

For other premises, solar protection devices shall lead to a solar factor of 0.35 or less or shall be of class 2, 3 or 4 according to EN 14501.

Reference

- Decree N°2007-363 dated March 19th, 2007,
- Legal decision dated May 3rd, 2007.

Existing buildings over 1000 m²

For buildings over 1000 m² and when the retrofitting cost estimate exceeds 25 % of the building value, the contractor shall improve the energy performance of the «new » building.

A thermal study shall be carried out so that the limits of consumption required are not exceeded.

Retrofitting shall reduce by 30% the energy consumptions for buildings other than dwellings.

It is also mentioned in this case that "*the renovation works shall not deteriorate the existing summer comfort*".

Those provisions came into force on **April 1st, 2008**.

Reference

- Legal decision dated June 13th, 2008.