



The mode of underfloor heating goes up at the time Roman. Concerned of its comfort in the thermal field, the town population is heated by means of terra cotta flues in which circulates of hot water or smoke. Today the hydraulic concepts are recognized for their comfort and their safety.

Since the decree of 1979, a new process of heating floor, based on a relatively low temperature (28°C maximum), regulable individually, appeared and developed.

The material tubes of synthesis came to improve this system, completely different from that of the years 1960.

At that time, indeed, many rental social housing is equipped with a system of heating floor. But the absence of insulation of the buildings involves heat losses. A temperature on the ground of 35°C causes the appearance of vascular problems and headaches.

With the request for Cochebat, the European Company of phlebology checked the comfort of the new system while making a study on 84 patients.

The integrated systems out of materials of synthesis ensure flow and temperature through an invisible installation releasing the totality of livable space that it is for the heating, the cooling or the distribution of the domestic fluids.



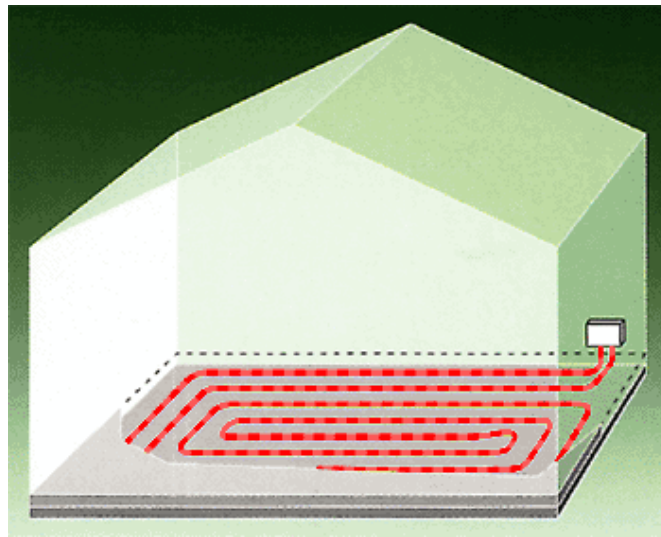
THE FLOOR  
HEATING/RAFRAICHISSANT



CENTRALIZED DISTRIBUTION OR the  
HYDROCABLE FOR  
HEATING AND THE MEDICAL ONE

## THE HEATING FLOOR/RAFRAICHISSANT

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### -- INVISIBILITE :

The heating floor by water low temperature consists of a network of material tubes of synthesis in which circulates of water. This network is placed on an insulator and the unit, drowned in a floating, diffuse flagstone of heat in winter and, with the reversible function, brings a cooling in summer. Dissimulated in the ground, this type of heating is perfectly invisible. By removing the radiators, it entirely releases the ground and the walls and thus brings a profit of space and a facility of fitting.

### -- ECONOMY:

The chauffant/rafraîchissant floor behaves like a large radiator on the ground. The heat, diffused by radiation, is homogeneous in all the part. With the suppression of cold zones, this mode of heating makes it possible to obtain the same feeling of wellbeing to 18°C as with another type of heating to 20°C (**thermal safety**). A lowering of a degree of the ambient temperature generating 7% of energy saving (Adème source), the quality-price-exploitation ratio of the chauffant/rafraîchissant floor is particularly interesting.

### -- COMFORT:

With the request for COCHEBAT, [a study](#) undertaken by the French Association of phlebology, attests that the heating floor by water low temperature does not involve any harmful effect on venous circulation (in particular in the legs). Moreover the chauffant/rafraîchissant floor few convections cause, removing the movements of air as well as displacements of microbes and dust.

### -- RELIABILITY:



The systems of underfloor heating by material tubes of synthesis have existed for more than fifty years in Northern Europe. In conformity with the French standards like to the European Standard n°1264, they fulfill the requirements of the New Acoustic Regulation (NRA). They are posed easily thanks to the system offer and to the flexibility of the tubes. The chauffant/rafraîchissant floor is compatible with all the sources of energy (gas, fuel, electricity, propane, soft energies...).

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## -- PRINCIPLE AND IMPLEMENTATION:

### Heating:

Water (coolant and filling of the installations) constitutes the vector of emission of heat or cooling. It circulates in a network of tubes, out of materials of synthesis, installed on slabs insulating and covered with a cover. This heating installation is then fed by a system of energy production.

This hydraulic technique is compatible in heating with all energies (natural gas, electricity, propane, fuel, soft energies).

The modulation is carried out by:

- a specific boiler for the heating floors,
- a standard boiler coupled to a regulation and system of control with or without production of domestic hot water.

### Cooling:

Of summer, the technique of cooling consists in making convey in the tubes of water at a temperature lower than the ambient temperature. The heat of the part is thus absorbed by the ground.

The production of cold water could be installed right from the start or later on.

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## -- APPLICATIONS:

The chauffant/rafraîchissant floor is appropriate for all the types of new buildings and heavy restoration. It ensures an absolute thermal comfort in the collective or individual habitat, the buildings of great volume, the tertiary sector or the communities (cribs, schools, gymnasias...)

## HEATING/RAFRAICHISSANT

### -- FRAME:

In nine as in rehabilitation.

### -- CONSTITUTION OF THE SYSTEM:



The system, integrated in a floating flagstone, is made up:

- of an insulator thermo-acoustics (guide tubes),
- material tubes of synthesis,
- of collecteurs/organes of adjustment for the regulation and comfort,
- of a floating concrete flagstone (concrete or cover of coating) or of a cover out of cement mortar or based on anhydrite (cover anhydrite) .

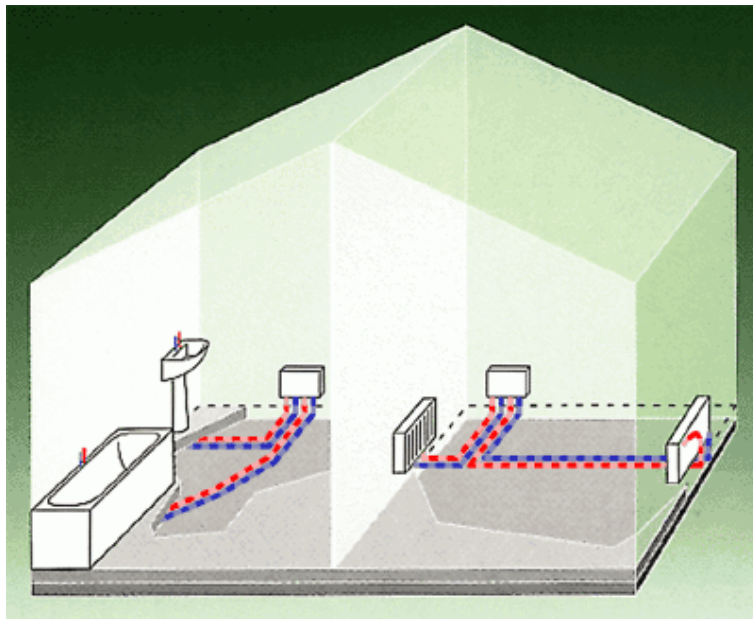
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### -- COATING:

Stuck coatings or seals can be implemented (tilings, ceramics stuck, fitted carpet) .

## CENTRALIZED DISTRIBUTION OR the HYDROCABLE FOR THE HEATING AND THE MEDICAL ONE

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### -- PRINCIPLE AND IMPLEMENTATION:

From collectors of distribution and balancing of the installation, material drains of synthesis under sleeves individually supply the hot or cold water sanitary appliances or the radiators. An implementation by hydrocâblé system is a means of carrying out an installation of quality, clean and without apparent pipes while decreasing the lengths of distribution.

### -- INVISIBILITY :

The technique of hydrocâblé consists in supplying the transmitters of heating or the sanitary appliances by material drains of synthesis. Embedded in the grounds or the partitions during construction, this system of distribution of the domestic fluids is very discrete and even invisible.

### -- COMFORT:

The individualization of the points of drawing up makes it possible to remove the effect "shower cold" and to have quickly hot water when several taps operation simultaneously.

Hydrocâblé for the food of the heating or medical does not require maintenance particulier. L' individualization of the points of drawing up makes it possible to remove the effect "cold shower" and to have quickly hot water when several taps operation simultaneously.

Hydrocâblé for the food of the heating or medical does not require particular maintenance.

## **-- RELIABILITY:**

The technique of hydrocâblé has strongly developed for 10 years. The tubes being placed under sleeves, they can be changed without deteriorating the structures. Surfaces of the material tubes of synthesis being smooth, there are no risks of scaling and their intrinsic qualities make them insensitive with corrosion.

## **-- APPLICATIONS:**

Hydrocâblé for the food of the heating and medical applies as well to the nine with the restoration. Its implementation easy and fast involves a reduced cost of installation.

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### **REPERCUSSION PHLEBOLOGIQUE OF THE HEATING FLOOR BY WATER LOW TEMPERATURE**

Anxious to erase definitively near general public, the negative image of the floor heating of the years 1960, COCHEBAT (national Trade union of and the integrated system component makers of heating, cooling and medical) wished to collect the opinion of the medical environment on the heating on the ground by water low temperature.

In collaboration with the European Company of Phlebology represented by its president, Pr Wallois like by its secretary-general, Dr. Vin, a study on the repercussion phlebologic of the heating on the ground was undertaken.

During nearly one year and on the unit to the territory, Dr. Brigitte Scala measured, near 84 people, the consequences of the process of heating on the venous system.

The subjects selected were, either of the healthy patients with or without family antecedents of venous problems, or of the suffering patients of venous diseases. Each one of them underwent two clinical examinations in 10 months of intervals.

A statistical analysis, carried out by Dr. François Allaert, then supplemented the terrain survey.

The conclusions emphasized that between the first and the second series of visits, the evolution of the venous disorders was directed according to three main tendencies: stability of the clinical state (69% of the cases), improvement of the clinical state (24% of the cases),

The whole of the questioned people were satisfied with the heating floor by water low temperature.

The clinical arguments did not indicate any perverse effect of this heating system. The ambient temperature (18°C) being constant whatever the place chosen in a part, the patients did not complain to feel under the plant of the feet a too strong heat or a feeling of cold, on the contrary, an impression of comfort was largely mentioned.

Vis-a-vis these data, it thus appears legitimate to conclude that the heating floor by water low temperature cannot be regarded any more as a factor of

risk of the venous disease .

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