

# **THE NEWOOD BUILDING SYSTEM®**

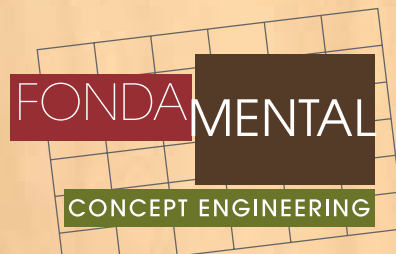
**A UNIVERSAL SOLUTION  
FOR ULTRA SOCIAL  
HOUSE BUILDING**



The Newood Building System® is a Fundamental concept.

# THE NEWOOD BUILDING SYSTEM®

is a Fondamental concept



## FONDAMENTAL - L'INGÉNIERIE DES CONCEPTS

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## ■ SUMMARY

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## ■ INTRODUCTION

The major qualities of the Newood Building System reside in its homogeneous constructiveness, the high insulation values, the formability of its material and the speed of production and assembly. Qualities that find their application in the field of **ultra social housing and self building**.

Today about 1 billion human beings live in slums. Their instant need for housing is estimated at some 200 million dwellings (info UN Habitat).

Many different building systems tend to promote the habitat of the poor with earth, straw, sand in bags, cement mixtures, wood, paper, plastic bottles etc. Most of them lack industrial dimensions. The answer they give will never be able to cope with the needs for the 21st century.

The Newood technology makes it possible to build very durable ultra-social housing with 6 times less wood than traditional wood skeleton building and yet with an incontestably higher mechanical resistance (earthquake resistant). A regional production can reach up to hundreds of thousands of dwellings per year. It is also a very easy and effective building system for self-built housing.

On our site [www.fondamental.info](http://www.fondamental.info) the reader will be able to find a more extensive presentation of the Newood Building System.

## ■ NEWOOD, THE BUILDING SYSTEM

The Newood Building System (NBS) is based on a **composite building material** with a core of expanded polystyrene (with thicknesses of 0,20 to 1,25 m and more) bonded all faces to «skins» of plywood or OSB panels of variable thicknesses) with one component structural polyurethane bonds **and a density of 50 kilos per cubic meter.**



A production of slightly curved panels.



Coatings :  
Left : cement projection on steel wire.

Center :  
polyuréthane lacquer.

Right : époxy - glass fibre.

The Newood building material enables the realization of highly resistant **shell structures, without skeletons or frames**, that include all the flat and curved shapes as well as hyperbolic parabolas and circular or elliptic domes.

The NBS also allows the realization of all the existing architectural building forms and all of the contemporary structures **with insulation values never reached before.**

The structural values of the Newood building material combined with the assembling method of the NBS allows to obtain **particularly homogenous and cohesive building forms.** In the building economy, the NBS belongs to the field of composite light weight wood constructions.

## ■ NEWOOD, SOME REFERENCES



Omega shaped passageway for the George Pompidou Museum in Paris.



«Quadra» hyperbolic parabola roof elements shown at the International Building Fair of Utrecht in the Netherlands.

Newood leisure house 5 x 5 m by 3,50 m high.



Newood, industrial building, shell segment 1,25 m large by a thickness of 40 cm and a free span of 15 meters.

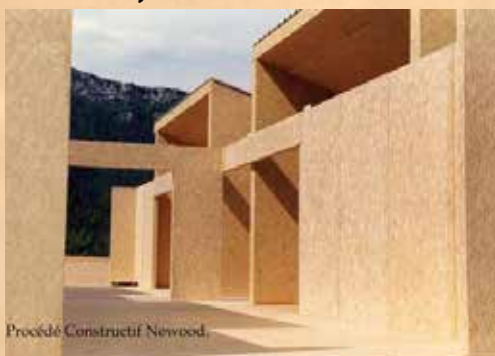
Newood, industrial building, length 30 m, free span 15 m, height 6 m, shell thickness 0,40 m, with a canopy and sliding Newood doors.



Floriade exhibition, 2 sided shops of 6 to 12 m front size.

Villa Oykos under construction.

Villa Oykos, parking area. Window door of an independant study with an acces ramp for handicaped. The main entry is situated at the left. The natural stones are a coating of the Newood building shape.



Procédé Constructif Newood.



## ■ NEWOOD, ULTRA SOCIAL HOUSING

Not taken into account the landed property, a one-story ultra-social Newood dwelling will correspond to the following minimum specifications :

| Specifications               | Quantities  |
|------------------------------|---|
| 1 Type of building           | : permanent, individual (and grouped) single story, ultra-social, earthquake resistant. |
| 2 Isolation                  | : integrated (walls, stage, roofs), R = 5.5.  |
| 3 Built-up area              | : overall dimensions : 25 to 50 m <sup>2</sup> .  |
| 4 Living area                | : 40 to 80 m <sup>2</sup> .   |
| 5 Height to the ridge        | : 21 ft.  |
| 6 Surface finishings         | : all surfaces with 5 mm flat cement board.   |
| 7 Electrical circuit         | : 8 light points (including outside façade) and 7 sockets.                              |
| 8 Int. layout : ground floor | : living room - kitchen, shower room and toilet.  |
| 9 Int. layout : first floor  | : 3 bedrooms and distribution.  |
| 10 Divers layout             | : sink, staircase, bunk beds in rooms 1 and 2.  |

Front view



Rear view



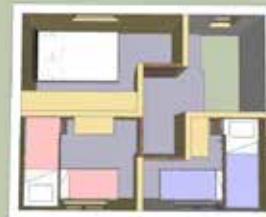
Side view



The above model has no architectural ambitions. It is a concept for the smallest family dwelling (6 inhabitants) regarding the ratio living area on built-up area.



Ground floor



First floor

## ■ NEWOOD, SELF-BUILDING

Fondamental developed a concept for the rehabilitation of slum inhabitants based on self-building.

In the case of upgrading of slums or the creation of new locations, monitors can learn to owners how to build and who at their turn will pass their new knowledge to others friends and neighbors. These monitors will be themselves originating from the concerned slum(s) and will have been formed by Newood Production Ltd. **The goal being to create a constructive buzz amongst the concerned populations.**

In practice, a family comprising 2 or 3 adults in a position to work, helped by one or two friends, can constitute a team of four builders who, accompanied by a monitor, and set up the constructive shape of their house (walls, stage, roofs) within one week. Then, it will take only a few weeks for the completion.

In the long term a large number of individuals, having acquired building experience, will be able to find work in building companies. After the building of their habitat, each family will receive from Newood Production Ltd a training certificate. The transfer of know-how being also a significant factor for the rehabilitation of impoverished populations.



In this particular concept of 40 m<sup>2</sup> living area on 100 m<sup>2</sup> landed property we included :

- self-storage of rain water,
- self-sanitation through the use of a dry toilet combined with a compost bin,
- self-production of energy with a photovoltaic panel., and
- self-production of food through vegetable gardening.



## ■ NEWOOD BUILDINGS, COSTS

In self-building, ex VAT, the cost of the dwelling defined above will rise in 19 800 €. [The price of the materials being those based on the average world prices.](#)

Or 20 000 €/habitat = 500 €/m<sup>2</sup> living area, turn-key, ex landed property.  
If purchase of land of 100 m<sup>2</sup> per dwelling at 50 €/m<sup>2</sup> = 5 000 € + habitat 20 000 € = 25 000 € = 625 €/m<sup>2</sup> living area, landed property included.

About the costs of ultra-social housing, one should not be mistaken. Less the options of photovoltaic equipment, the storage of water, the dry toilet and the compost bin, the price falls to 16 300 € or 410 € per m<sup>2</sup> living area. On this price one can probably still cut down, what would go inevitably at the expense of the mechanical resistance and the durability of the buildings. Later on, one should not have to be confronted with the situation of an early necessary renewal for lack of initial quality of buildings.

## ■ NEWOOD PRODUCTION

The vocation of a Newood industry, in any country, will be to produce pre-fab elements for general building. A Newood Production unit will not be a building company. Building companies or individual builders, everyone will be able to acquire at Newood Production, prefab building elements (on catalogue or custom-tailored) necessary for the building(s) of its choice.

Newood Production will integrate the activities of :

- the production of expanded polystyrene (EPS),
- the transformation of wood panels, EPS and adhesives into prefab elements, and
- the sale of surface finishings, bonds and other building accessories.

Newood Production will mainly supply four markets to know:

- the building companies specialized in housing,
- the building companies specialized in industrial buildings (cool houses),
- EPS panels for general insulation and other packaging, and
- all individual buyers whoever they are.

A first production unit will have a production capacity of prefab elements for 6000 dwellings per year in 8 hours per day with 400 workmen and 50 technicians and employees for the management. Such a unit can without problems pass on a double shift production. The employees of Newood Production will be mainly appointed among the population of the concerned slum(s). The access of the young people will be privileged.

For the creation of a Newood prefab unit it is necessary to count an investment of about 2.5 million euros (ex buildings) including mainly 1.5 million euros for the EPS manufacturing unit and 1 million euros for the Newood prefabrication.

Newood Production will transmit the know-how of its technology for free as well to the professionals as the non professionals.

## ■ FAQ's

### **HAS THE NEWOOD BUILDING SYSTEM BEEN TESTED ?**

Yes. The Newood building material has been tested in France at the CSTB (Centre Scientifique et Technique du Bâtiment = Scientific and Technical Building Center) for its fire resistance (see hereafter). The mechanical resistance of the Newood building material has been tested by TNO in the Netherlands (Toegepast Natuurwetenschappelijk Onderzoek = organization for applied physical scientific research). The result shows in particular very high shearing, flexion, rupture and buckling resistances.

### **WHAT IS THE FIRE RESISTANCE OF THE NEWOOD BUILDING MATERIAL ?**

The fire resistance of the Newood building material is largely sufficient for all buildings up to two storeyed houses. If the interior coatings of the buildings are composed of plasterboard it is without a doubt possible to built up to four or five levels (and more) without increased fire danger. Moreover, plasterboard is also an excellent humidity regulator. Burning EPS produces the same gases as that of burning wood. The NBS also include expanded clay balls fire layers and walls. In the case of ultra-social dwellings we will use flat fibercement finishings (asbestos free) for an even higher fire resistance.

### **WHAT IS THE DURABILITY OF THE NEWOOD BUILDING MATERIAL ?**

The aging resistance of the Newood building material is excellent and depends directly on the chosen wood panels, most often OSB of which the aging resistance is very well known and unanimously appreciated. The most ancient Newood buildings are now over twenty years old et don't show any sign of structural aging. Newood buildings are perfectly perennial and most ideal for future housing solutions for mankind the world over.

### **IS EXPANDED POLYSTYRENE ECO FRIENDLY ?**

The chemical formula of expanded polystyrene is exclusively based on carbon and water. Expanded polystyrene does not contain any ozone depleting substances and none is used in its manufacture. EPS has no nutritional value to support fungal, bacteriological or animal growth. EPS is user friendly non toxic and non irritant.

### **ARE OSB PANELS ECO FRIENDLY ?**

OSB panels are manufactured from a wide range of fast-growing species and from relatively small trees. The production process utilizes a maximum amount of wood fiber from each tree that is harvested. Due to the type of resins used in wood-based structural panels like OSB, they emit very low levels of formaldehyde.

### **WHAT ABOUT RECYCLING THE NEWOOD BUILDING MATERIAL ?**

The Newood building material can be easily recycled by shredding the OSB or plywood skins and reintroduce the shredded material in the production of new OSB panels. Expanded polystyrene is able to be recycled, it can be granulated for use in construction applications.



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