

NEOPOR SYSTEM

Lightweight concrete utilizing in excess of 25% of fly-ash

Neopor cellular lightweight concrete (CLC) has been used in over 40 countries over the past 25 years to produce over hundred thousand houses and apartments, also schools, hospitals, industrial and commercial buildings.

CLC is an air-cured lightweight concrete that can be produced at project site, utilizing equipment and molds normally in use for conventional concrete.

The density recommended is 1.000 kg/m³ (oven-dried) for blocks and 1.200 kg/m³ to produce prefab elements and walls cast in-situ. The typical mix for a 1.000 kg/m³ density CLC to be used in blocks is as follows (to produce 1 m³)

Cement (Portland):	190 kg =	61 liters
Sand (0 - 2 mm or finer):	430 kg =	164 liters
Fly-Ash:	309 kg =	100 liters (approx)
Water:	250 kg =	250 liters
Foam (neopor-600):		<u>423 liters</u>

Wet density 1.179 kg/m³

Total volume (submerged in water) 1.000 liters (= 1 m³)

Expected (oven-dry) density, approx. 1.000 kg/m³

Content of air in concrete approx. 43%

Content of Fly-Ash in solid material (929 kg): 33%

Content of Fly-Ash in oven-dry material: 31 %

Benefits of CLC blocks/elements

- Tremendous weight reduction
- High thermal insulation
- Optimum fire rating
- Substantial material savings:
 - no gravel used
 - little cement
 - less steel in structure and foundation
- Easy and fast production
- No primary energy and reduced transportation costs
- Boon for remote areas with only sand available



Affordable houses cast in-situ in Indonesia in density 1.200 kg/m³ and wall-thickness of only 60 mm. One house each day per each mold. Frames for openings (d/w) and facility tubes cast-in.



Light-weight block-production on site in India. Specially designed molds produced locally to Neopors specifications are assembled and waxed and poured with CLC density 1.000 kg/m³.



Demolding of blocks the day after casting or earlier it accelerated by either steam, heat or chemicals.

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CLC, like conventional concrete ages well, increasing its strength by as much as 50% (!) between 28 and 90 days after pouring. As long as CLC draws humidity from the atmosphere it will keep on increasing its mechanical properties.

Only 1 kg (1 ltr) of Neopor-600 foaming agent is essential to produce 1 m³ of CLC for instance in a density of 1.200 kg/m³: A 200 kg/liter drum of Neopor lasts for more than 200 m³ of CLC. Neopor has a shelf-life of minimum 24 months.

Molds or design to produce inexpensive molds locally are provided by Neopor.



Shape and size of blocks are given by the molds. Blocks are sprinkled with water. Production and curing on the construction site to save transport and multiple handling.

Costing

Neopor customers undertook extensive costing in different countries to evaluate competitiveness against conventional concrete blocks, clay-bricks and autoclaved aerated blocks on the finished wall. In particular if fly-ash is utilized, blocks of CLC often turn out to be the most competitive ones, also due to little equipment required (no block-making plant) can be produced on the site, saving transport and multi-handling.

In view of fly-ash - an environment pollutant industrial waste - being a major ingredient of CLC, and this being a good substitute for ordinary clay bricks (which use high primary ENERGY and precious agricultural top-soil), the Government of India for instance has given special Import duty concessions.

CLC is an excellent and competitive material for low-rise, load-bearing construction and outside walls as well as partitioning work in multi-storeyed blocks.

Popular block sizes are:

600x200x200/100mm
500x250x200/100mm
500x400x100mm
or as desired

Blocks are cast in vertical position to offer equally accurate sides, given by the mold. Only one side (the top when cast) is not given by the mold as open-top, which is screeded. This side will face the next block in masonry anyhow.



Blocks are used for outside walls and partitions on highrise structure of conventional concrete.

Curing of CLC takes place within the same period as conventional concrete. If cast in the evening, the concrete can be demolded next morning. Curing can be speeded up by either heat, steam or chemical (accelerators). - As in conventional concrete CLC may also be coloured (adding pigments).

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Substantial weight reduction in high-rise by using CLC for multiple purpose (walls, floor screeds, balcony rails, bath rooms etc) saving tremendous quantities of steel in foundation.