



RASTRA vs. Foam Panel ICF

The green building movement, already a huge factor in the commercial sector, is likely to transform residential construction as well. One pundit claims it will transform building in the same way electric lights and air conditioning did last century.

Insulating Concrete Forms (ICFs) traditionally are made of expanded polystyrene (EPS). Also, RASTRA started out this way in the late 1960s. Insulating Concrete Forms (ICFs) are well-positioned to take advantage of this trend; they're durable, energy-efficient. However, some disadvantages became obvious and very soon RASTRA was looking for solutions. This led to a new material which later was called Compound or Composite ICF's and ICF turned into ICCF. The **Compound ICFs** (ICCF) are the most environmentally friendly ICFs. While regular ICFs are made out of expanded polystyrene (EPS), RASTRA Compound ICF panels are made from a mix of recycled expanded polystyrene and Portland cement paste, thus avoiding many disadvantages known of other ICFs. RASTRA was the first to develop regular ICF's (the first basic patent (OE291.498) was filed in November 1965 in Austria and **RASTRA is recognized as the inventor and market leader** in the ICCF category.

Installation

Anyone who has previously installed a foam panel ICF product understands the challenges associated with building with this material. Because of the inherent weakness of the material, an extreme amount of bracing is required to control blowouts and bowing from the pressure of the concrete. Concrete pours are usually limited to 48" (120cm) at a time to help control the problem. Because RASTRA is much more stable and denser, it requires no bracing during construction. Reduced bracing and seam reinforcement means shorter construction cycles. Due to the size of the RASTRA panels, walls go up very fast. Due to its integrity RASTRA can be preassembled in the plant and large wall sections can be shipped to the site and installed incredibly fast.

RASTRA does not need preparation before finishing. RASTRA accepts plaster, drywall, Portland stuccos, and acrylic finishes, even tiles and veneers applied directly to the panel, eliminating the need for membrane, wire mesh and vapor barriers. RASTRA walls can be shaped, rasped, drilled, and cut into shapes easier than wood, something never possible with other ICF systems.

Perhaps the greatest cost-saving benefit from building with RASTRA versus a foam panel ICF system is the amount of time saved. A study was conducted by the Insulating Concrete Forms Association comparing the labor hours needed to construct a 1,100 square foot home. The findings in this study showed that a home built using a regular foam ICF panel system took 96 hours to construct while a home using RASTRA required only 68 hours. This difference of almost 30 hours is quite substantial and would certainly be much greater if building an average 3,300 square foot home. This time would be further reduced for at least 30% by using preassembling RASTRA walls.

Recycled Content

RASTRA Compound ICF can use a huge amount of recycled EPS that is usually destined for the landfill. Thousands of gallons of fuel, energy and labor are saved annually by reducing operation of landfill equipment. Consider also that EPS is a non-biodegradable product, which consumes space at landfills as well. Foam panel ICFs require the production of new polystyrene while RASTRA uses polystyrene waste as much as is available.

RASTRA Compound materials use an average 30% less concrete than a comparable wall made from foam panel ICFs without compromising strength. Cement production uses an extreme amount of energy and produces a lot of CO₂. By decreasing the amount of cement required, CO₂ emissions are also decreased by a significant amount.

Compound ICF walls are impervious to mold, termites, and other pests without any type of pesticide or special treatment that may leach into the soil. Several tests confirmed that rodents and insects do not nest or attack the RASTRA material, although they do nest and remove regular EPS for nesting. Dangerous mold, like aspergillus niger, rhizopus nigricans ect. do not form, RASTRA is chemical neutral and causes no problems for chemical sensitive persons. RASTRA keeps humidity under control.

Fire Rating

Foam panel ICFs must be covered with drywall to meet fire code. RASTRA does not require drywall or additives to satisfy fire codes and has achieved a 4+ -hour fire rating without wall covering. Fire codes require foam ICFs the use of so called "modified" EPS to produce foam ICF's. This modification is achieved by an additive which may contain HBCD (hexabromocyclododecane) as flame retardant, a chemical that is known as bio-accumulative toxicant which has been banned recently and added to dangerous substances by the European Union for its potential health hazards. RASTRA doesn't need to use modified EPS.

Independent lab testing put RASTRA product to the test by subjecting a full-scale wall with no coatings of any type to a constant 2200°F (1200°C) flame. After five hours of continuous burning, the temperature on the surface on the opposite side rose only 7° F (3°C) . Fire spread and smoke development testing showed no ignition, flame spread of zero and smoke density of less than 5 (450 is permissible).

Climate Control

To create a healthy and comfortable room climate, walls should work in harmony with the HVAC unit to control humidity. A major problem of the foam panel ICF is damp air and mold. To remedy this problem some builders installed additional air exchangers in foam panel ICF houses, which may reduce condensation, but do not improve the room climate. RASTRA has a **vapor diffusion factor of 7.3, a perfect breathing wall**, allowing a micro moisture exchange, due to the cellular, micro-porous structure of RASTRA. In blower door tests, a RASTRA built home tested at 0.0379 air changes per hour, or once every 26 hours.

One of the most important differences between RASTRA and a foam panel ICF is the ability to utilize the wall's Thermal Mass. Thermal mass is a property that enables building materials to absorb, store, and later release heat. Buildings constructed with mass walls of concrete have a unique energy-saving advantage over framed walls. R-value in mass walls, like RASTRA can increase by a factor of almost 2, depending on climate.

Foam ICF panels do incorporate a concrete layer, however, the concrete cannot work as thermal mass. The insulation is between the wall's core where energy is stored and the interior, therefore this benefit is greatly reduced. RASTRA does not use solid foam panels and as a result allows for much greater use of the stored energy. This lowers energy costs and creates a more consistent climate.

Reducing the concrete in the wall translates to better insulating properties. Using 2/3 the concrete puts 1/3 more insulation in the wall. When completed, the wall performs even better; its substantial thermal mass dampens and time delay temperature swings in a more accurate way than foam panel systems.

RASTRA Advantages over Foam Panel ICFs

- ❖ Superior Thermal Performance
- ❖ Lower Installed Cost
- ❖ Uses average 30% less concrete
- ❖ Much improved air exchange rate & climate control
- ❖ Can be used below grade
- ❖ Curved walls and arched openings fast and easy
- ❖ Meets fire code without drywall covering
- ❖ Accepts plaster and stucco directly
- ❖ Able to pour full height wall in single pour
- ❖ No to little bracing required – saves time – truer walls
- ❖ Stronger panel avoids blowouts
- ❖ Cut and shaped with standard woodworking tools
- ❖ Faster installation
- ❖ Impervious to insects

