Experience the Advantage ICF System

The Advantage ICF System® is a patented insulating concrete forming system consisting of two layers of expanded polystyrene (EPS) insulation connected with web connectors moulded into the EPS insulation. The top and bottom edges of Advantage ICF System blocks have pre-formed interlocking mechanisms which ensure web connectors align vertically for attachment of surface finishing materials.

When the installed Advantage ICF System blocks are filled with concrete, an insulated, monolithic concrete wall of uniform thickness is formed. The result is a superior, energy efficient wall that will provide long-term energy cost savings and add resale value to the building.
Effective Thermal Resistance

Walls built with the Advantage ICF System provide improved energy efficiency that result in reduced operating costs for the life of the building. In addition, since less energy is being used, related greenhouse gas emissions are proportionately reduced. Today, more than ever, building an energy efficient structure is the right environmental choice and will provide savings in energy costs.

The higher effective R-Value of the Advantage ICF System significantly reduces heat transfer compared to conventional building methods resulting in lower energy consumption for heating and cooling.

Walls built with the Advantage ICF System incorporate a monolithic layer of expanded polystyrene (EPS) insulation over the interior and exterior face. Walls built using wood-frame construction include framing members at 406 or 610 mm (16” or 24”) on centre with insulation between them. The effective R-Value of a wall assembly provides a better measure of thermal resistance because it includes the effect of thermal bridges in the wall assembly.

A home built using the Advantage ICF System will make a wall structure at least 40% more energy efficient and significantly reduce heat transfer compared to a new home constructed using wood stud framing and batt insulation. This will translate into a savings in energy consumption of at least 30%. The graph below provides a comparison of the effective R-Value for a wall assembly constructed using the Advantage ICF System versus a wood frame system with R-20 insulation.

A poorly insulated below-grade wall can account for more than 50% of total heat loss from a house. The graph below provides a comparison of the effective R-Value provided by a below-grade wall constructed with the Advantage ICF System wall versus a typical concrete wall with wood frame wall and R-8 insulation.

Minimum thermal insulation requirements in building codes are typically nominal values based on the centre-of-cavity R-Value at the point in a wall cross-section containing the most insulation. In wood-frame construction, this nominal value indicates the thermal insulation required between framing members. The "effective" R-Value of a wall assembly, calculated as per ASHRAE parallel paths method, on the other hand, refers to the complete assembly, including the effect of thermal bridges such as wood framing members.
Reduced Noise Transmission

A widely accepted system of classifying walls or partitions for sound insulation value is the Sound Transmission Class (STC) rating for a structure. Essentially, the STC rating provides a basis for comparison against a standard for sound deadening of a structure at various frequencies. A high STC rating indicates a more efficient sound absorption characteristic.

Many builders design for an STC 55 or more in high quality accommodations. Designing for a higher value provides a margin of safety to allow for problems during construction.

A typical 2”x 4” wood stud wall construction with batt insulation in the stud cavity would provide an STC 32. A monolithic concrete wall constructed using the Advantage ICF System with 12.7 mm (1/2”) gypsum board interior finish would be expected to provide a rating in excess of the STC 55 as recommended for high quality accommodations.

A wall constructed using the Advantage ICF System provides superior protection against sound transmission from outside sources.

Reduced Air Leakage

A blower door test is commonly used to assess the energy efficiency of new building construction. The test quantifies the air leakage rate from a structure in terms of air changes per hour.

Unintentional air leakage can be one of the biggest sources of heat loss in many buildings. Air leakage rates vary widely for different types of construction methods as illustrated in the chart on the left (excerpted from a NRCan review of national trends in air leakage for houses in Canada).

A 3,900 square foot bungalow constructed using the Advantage ICF System for both above and below grade walls was tested for air tightness in comparison to energy efficient design requirements. The air leakage rate was found to be 0.22 air changes per hour indicating a very airtight structure. This confirms that the solid wall construction provided by the Advantage ICF System will result in significant reduction in air leakage versus other types of wall construction.

Providing an adequate fresh air supply is an important consideration in energy efficient buildings. Advantage recommends that home owners incorporate the use of heat recovery ventilators in their design.

It is important to note that the air tightness of a building built with the Advantage ICF System also depends upon components incorporated into the building construction to maintain an energy efficient design. Components used in the building would be typical of those recommended for the R-2000 or Energy Star residential energy efficient programs.
Installation Ease & Training

The Advantage ICF System provides benefits for trades installing other parts of the wall assembly. The web connectors are designed to support reinforcing steel cast into the concrete in the correct location and act as a member to fasten interior and exterior finishings.

The patented Advantage ICF System features a unique web connector and panel interlock system that ensures the recessed attachment surfaces in the interior and exterior EPS insulation panels always line up vertically. This simplifies the attachment of surface finishes, such as drywall, stucco and siding. The combination of the two EPS insulation layers and the solid concrete core eliminate the need for separate air and vapour barrier materials.

Advantage ICF System recognizes the need for installation training to ensure that Advantage ICF System wall assemblies are constructed correctly. For this reason, a detailed Installation Manual is available along with on-site training. Installation videos may be viewed at: www.advantageicf.com

Features & Benefits of an Advantage ICF System

Features

- More energy efficient
- Reduced sound transmission
- Resistant to storms and high winds
- Specialty 45°, 90° corners, brick ledge, height adjuster and tapered top block
- Fast, year round construction
- Superior insulation
- Local supply

Benefits

- Lower utility bills, saves money, more environmentally responsible
- Comfort, privacy
- Safe and secure
- Flexibility in design
- Convenient construction schedules
- Comfortable living with warm consistent temperatures throughout house
- Higher comfort level in dealing with established local building supplier
- Wide window sills
Building Code Compliance

The Advantage ICF System has been reviewed for compliance with building code requirements in Canada and the United States. The Advantage ICF System has been evaluated for performance as a stay-in-place insulating concrete forming system.

Canadian Construction Materials Centre (CCMC) Report 13101-R confirms compliance with the National Building Code (NBC) of Canada. The CCMC report includes design tables for above and below grade concrete walls for residential construction. Prescriptive design requirements for above and below grade walls can be found in the NBC.

ICC Evaluation Service Report ESR - 1578 confirms compliance with the International Building Code (IBC), the international Residential Code (IRC), and the Uniform Building Code (UBC). Design of concrete walls formed by the Advantage ICF System can be completed using the prescriptive requirements in the IRC or Portland Cement Association (PCA) publication Prescriptive Method for Insulating Concrete Forms in Residential Construction (publication No. EB118).

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<thead>
<tr>
<th>Residential homes</th>
<th>Recreational homes and cottages</th>
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<td><img src="image2.png" alt="Recreational homes and cottages" /></td>
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<td>Party walls for residential projects</td>
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Villaggio Inner City Condominium

Safe, quiet living close to downtown

Traffic noise, interior noise, fire safety and high energy costs are all serious concerns that builders of new inner city residential condominiums must overcome to attract buyers.

The 12-unit, three storey Villaggio Kensington condominium development, just minutes from the city’s downtown core, overcomes all these concerns by using the Advantage ICF System as its foundation and primary wall assembly system.

The builders of Villaggio Kensington, LaCosta Housing Ltd., chose the Advantage ICF System after researching residents’ expectations and determining that, to be a success, the project had to provide residents with the quietest living environment and the lowest condominium fees possible.

LaCosta is now convinced that, overall, the savings in energy use that the residents have experienced as a result of the Advantage ICF System have been exceptional, averaging $75/month/unit including parkade and common areas. This has led to the lowest condo fees in the city of Calgary.

Residents will be protected from urban noise by the sound dampening effect of the ICF System interior and exterior wall systems.

Advantage ICF System Construction
Foundation, exterior and interior walls

The condominium’s Advantage ICF System exterior walls begin at the parkade and foundation levels and are carried through to the top storey. These walls, which sandwich a core of reinforced, cast-in-place concrete between two panels of Plasti-Fab EPS insulation, provide a concrete mass with superior soundproofing and insulating qualities when compared to a typical wood-frame exterior wall.

40 per cent R-Value improvement

Residents have appreciated their lower heating and cooling costs as a result of the Advantage ICF construction. The effective R-Value provided by the Advantage ICF System is R-23.5 which is 40 per cent greater than the R-16.8 for typical above-grade construction using 2 x 6 inch wood stud walls with R-20 batt insulation. Higher effective R-Value means lower heating and cooling fees.

Advantage has been exceptional, averaging $75/month/unit including parkade and common areas. This has led to the lowest condo fees in the city of Calgary.

Internal Soundproofing

To address concerns about internal noise, LaCosta increased the internal soundproofing of the individual residences by also building the interior walls with the Advantage ICF System.

Residents have found that the Advantage ICF System more than adequately addresses their concerns regarding fire safety. The six inch thick steel reinforced concrete walls formed by the Advantage ICF System with gypsum board on the interior face provides a three-hour fire rating.

LaCosta did not experience any construction delays relating to building codes or inspections as a result of the use of the Advantage ICF System.
## Advantage ICF System Product Specifications

<table>
<thead>
<tr>
<th>Product</th>
<th>Feature</th>
<th>150mm Metric</th>
<th>6” Imperial</th>
<th>203mm Metric</th>
<th>8” Imperial</th>
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Advantage ICF System Specifications

General Product Description

EPS Insulation: Complies with CAN/ULC-S701, Type 2 and ASTM C578, Type II
Contains no CFCs, HCFCs, HFCs or formaldehyde.
ECP-Certified Insulation

Concrete: 20 MPa (2900 psi) at 28 days
Nominal thickness 152-mm (6") or 203-mm (8")

Sound Transmission: STC Rating > 55

Fire Resistance Rating: 3-hour rating for 152-mm (6") or 4-hour 203-mm (8") concrete wall per National Building

Air & Vapour Barrier: Provided by combination of monolithic concrete thickness and EPS insulation.

Code Evaluation Reports: CCMC 13101-R (Canada) and ICC-ES ESR-1578 (USA)

Energy Efficiency - Typical Effective Thermal Resistance (R-Value):

Below Grade: Advantage ICF System @ R-22.7 (RSI - 3.99)
Note: R-Value based upon typical construction with 1/2" (12.7 mm) gypsum board on interior face.

Above Grade: Advantage ICF System @ R-23.5 (RSI - 4.14)
Note: R-Value based upon typical construction with 1/2" (12.7 mm) gypsum board on interior face and vinyl or
metal siding on exterior face.

Contact Information

Contact Plasti-Fab® Ltd.
Tel: 1 888 446 5377
www.advantageicf.com