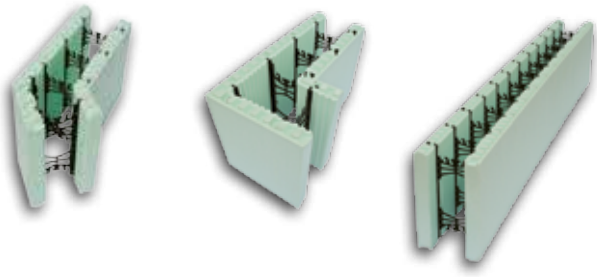


Building Has Evolved™

architect

builder/developer

contractor

design professional

NUDURA®
INTEGRATED BUILDING TECHNOLOGY
Building Value

Buildings today demand reliable, energy efficient building envelopes that provide superior performance benefits to minimize energy costs, reduce carbon emissions, and maximize property value. NUDURA structures offer superior strength, storm, sound, and fire resistance and are why the design community, developers and contractors across the world continue to choose NUDURA's Integrated Building Technology as a proven alternative to traditional building methods.

Our Insulated Concrete Forms provide design professionals, architects, home owners and contractors the freedom and versatility to design and build a structure the way it was envisioned. Building with NUDURA gives you the opportunity to build faster and more efficient, while offering your clients an eco-friendly structure with substantial benefits that contribute to long-term energy savings.

NUDURA is committed to leading the industry in product innovation and is unmatched by any other Insulated Concrete Form. We are strongly committed to improving the building process to support environmental issues, reduce energy consumption, and to save our valuable environmental resources for future generations. When specifying NUDURA you can assure your customers that you are using the best building solution available today.

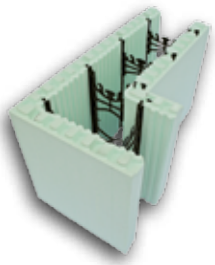
Norton Pediatric Center

The 70,040 sq.ft. (6,506 m2) Norton Pediatric Center was built to hospital standards using NUDURA Insulated Concrete Forms. Energy usage is approximately 112.8 kBtu/Sq.ft./mth compared to the average Center (without NUDURA and other energy efficient construction materials) at 400.0 kBtu/Sq.ft./mth.

For more information visit **nudura.com.**

innovation makes us the better building choice.

the principle is simple.

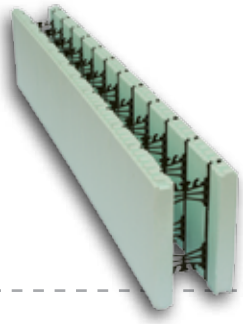


NUDURA Insulated Concrete Forms offer a variety of superior benefits when building a structure. NUDURA Forms consist of two panels of Expanded Polystyrene (EPS) foam that are 2 5/8" (67 mm) in thickness and connected together with our patented web system that is made of 100% recycled material. NUDURA Forms are stacked, steel reinforced and filled with concrete, which completes the building envelope of your commercial or residential structure in one building step. NUDURA Forms are available in a variety of shapes and sizes to accommodate all types of building requirements and designs.

eco-friendly building.

NUDURA Insulated Concrete Forms provide greater energy solutions and can reduce thermal transfer to as low as 1.9 BTU/ft2/hr (5.99 W/m2.k) even at temperatures as low as -11 deg F (-23 deg C). The superior Performance Value of NUDURA comes from the stable thermal mass that the concrete provides. NUDURA offers form sizes that provide a solid concrete core of up to 12" (304 mm), providing you maximum energy efficiency, strength and comfort.

what you can expect from NUDURA.



NUDURA has an Authorized Distributor network throughout North America that can provide you with assistance for spec'ing and ordering our products. NUDURA prides itself on providing you the best support from a strong, reputable businesses within your local geographic areas. Our Authorized Distributors can provide local training and on-site assistance during the building phase with NUDURA products.

Building Has Evolved™

sustainable building starts with nudura.

maximum energy efficiency.

ICFs provide greater energy solutions for any structure. Ongoing laboratory and site testing has proven a home or commercial building built with NUDURA can reduce thermal transfer to as low as 1.9 BTU/ft2/hr (5.99 W/m2.k) even at temperatures as low as -11 deg F (-23 deg C). The energy performance that comes from a NUDURA form is the combination of thermal mass and airtightness. Building with NUDURA reduces a building's operational energy demands, and as a result, the structure's carbon footprint on the environment.

greater sound, fire & impact resistance.

NUDURA forms act as an effective sound barrier by dampening sound vibrations from unwanted outside noise, ideal for both residential and commercial construction, providing STC (Sound Transmission Class) ratings as high as STC 50*.

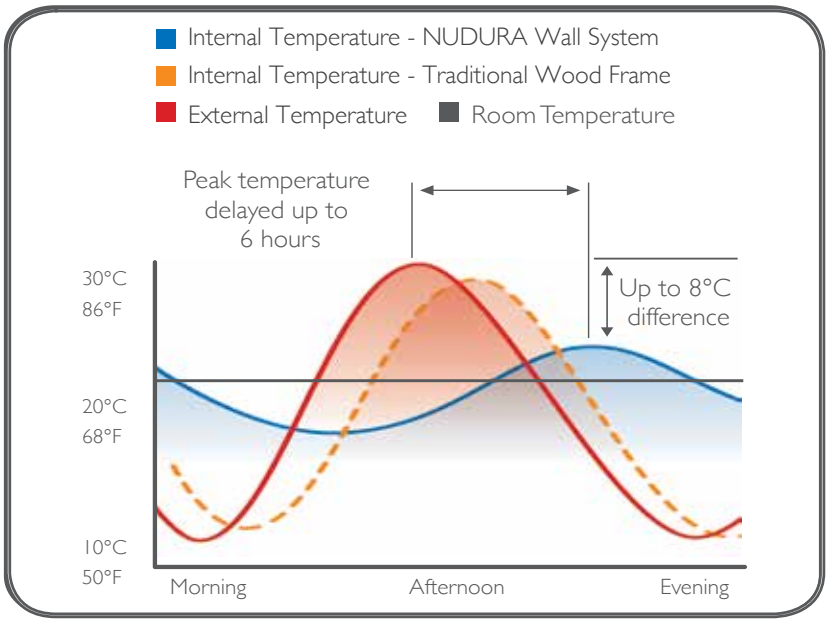
The strength of NUDURA comes from the solid concrete core. NUDURA walls are built with steel reinforced concrete and a non-toxic fire retardant expanded polystyrene foam, providing a fire protection rating of up to 4 hours. NUDURA also provides greater impact resistance and will withstand winds of up to 250 mph (402 km/h) ensuring that the occupants of the building or home are safe and secure in almost any situation. Our concrete embedded multi-purpose roof/truss anchor system provides greater resistance to wind uplift forces than most other conventional hurricane strap anchor systems.

long-term value.

A NUDURA structure is built to last and retains its value longer. The main structural element in a NUDURA building is reinforced concrete, which offers substantially better durability and requires less maintenance and repair over its lifetime.

**STC 50 rating based on minimum 6' (152 mm) NUDURA form and concrete core thickness or larger installed with code compliant finishes mounted both side of wall assembly in accordance with NUDURA Installation procedures.*

Stabilizing effect of thermal mass on internal temperature.



Based on no additional mechanical heating or cooling.

there's a lot more to "energy efficiency" than r-value.

thermal mass & r-value.

The solid mass of the NUDURA wall has some very unique qualities. NUDURA Insulated Concrete Forms have a tested R-Value of 23.59. The monolithic concrete is layered between two continuous panels of 2 5/8" (67 mm) EPS foam, which isolates the concrete and significantly reduces the flow of heat through the wall. It's the combination of the high thermal mass concrete core, continuous insulation layers inside and out and superior air tightness that make our wall limit heat conductance down to a maximum of 1.9 Btu/SF/Hr at -11 degrees F (5.99 W/m2 at -20 degrees C).

high thermal mass concrete core

Thermal mass is the ability of a material to absorb and store heat energy. A lot of heat energy is required to change the temperature of high density materials like concrete. Concrete is said to have a high thermal mass. Lightweight materials such as timber materials have low thermal mass, therefore they do not absorb and store heat energy effectively.

continuous insulation layers inside and out

NUDURA provides a complete layer of EPS Insulation on the exterior and interior of your building. With NUDURA you will not experience Thermal Bridging as would be found in a stick frame house. Wood components have much higher thermal conductivity than EPS Insulation. Everywhere there is a wood stud, corner post, framed floor or wooden lintel is a location where there is lessened or NO batt insulation. These areas create drafts and cold spots in the wall. A NUDURA home will not have any cold areas as the insulation is continuous around the whole building

superior air tightness

NUDURA creates a much more "air tight" building than any other construction method. Our EPS Insulation acts as an Air Barrier, as proven by accredited ASTM testing. The design of our Interlocks and patented DURALOCK™ Technology ensure our blocks are mechanically linked together, thus preventing gaps which could allow air to flow through the assembly. Other ICF companies rely on additional tying of the forms to create this seal, which increases the labour time and money spent.

For more detailed information on thermal mass and r-value calculations visit nudura.com/thermalmass

disaster resilience.

The performance of a NUDURA Wall System is designed to withstand some of Mother Nature's worst and have been used for commercial and residential structures throughout North America, saving building owners from having to rebuild their homes and businesses. With NUDURA you can be sure that your building will withstand high winds, fire, seasonal elements and the test of time. The strength of NUDURA comes from the steel reinforced solid concrete core, resulting in greater impact resistance. NUDURA structures can withstand winds up to 250 mph (402 km/h) ensuring that your client's business or family home is safe and secure in almost any situation.

In 2004, a home built with NUDURA Insulated Concrete Forms, survived the severe storm in Florida while other wood-frame built homes in the neighborhood did not.

First LEED Gold building in Louisville, KY. full thermal envelope exceeds ASHRAE/Standard 90.1-2004 by 20%. Its first year's energy consumption was 13.6 kBtu/ft2•yr and earned an ENERGY STAR rating of 100. For more information visit ***nudura.com****.*

© CMTA Engineering Consultants

NUDURA forms are manufactured with industry leading patented technologies that are exclusive to NUDURA, offering you a full line of innovative products designed to provide superior energy efficiency, greater strength, and sound resistance. Our building envelope provides an affordable eco-friendly building solution that allows you to build faster, more efficiently and offers substantial benefits over traditional construction.

Innovation makes us the solution to better building.

- **DURALOK Technology™** - Securely locks forms into place with a triple tooth interlock eliminating the need to wire or glue forms, resulting in reduced labor costs during installation. Once the forms are stacked together a continuous full height-fastening strip ensures wall heights are always accurate, compared to other forms without full height-fastening which can cause wall height shrinkage once concrete is placed. DURALOK makes NUDURA the strongest in the industry.

- **DURAFOLD Technology™** - Patented hinged web technology allows the entire NUDURA form line up to fold and ship flat, allowing for 40% more product on a truck compared to other Insulated Concrete Form products. Once on-site, simply unfold and stack.

- **DURAMAX Technology™** - Largest standard form on the market measuring 96" x 18" (2438 x 457 mm). Our 96" form creates 60% fewer joints in the wall compared to other wall systems and allows installers the ability to place 12 sq.ft. (1.11m2) of wall area with one block.

- **4-WAY REVERSIBLE System** - Patented foam interlock allows the form to be 4 way reversible, eliminating left and right corners, which helps speed up the building process and reduces product waste on-site.

Watch our Innovation Video at nudura.com/innovation

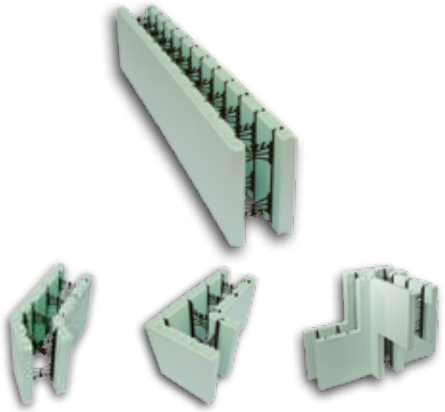
a series of products for all building types.

nudura id series

The NUDURA Wall System completes six building steps with one product:

1. Form system
2. Wall structure
3. Insulation
4. Air barrier
5. Vapour control barrier
6. Interior & exterior fixing points

NUDURA offers a form line up that includes 90°, 45°, T Forms, Radius forms, Straight (standard) forms, Brick Corbel along with a variety of other form combinations to meet the requirements of any design. To meet any building requirement NUDURA Forms are offered in 4" (100mm), 6" (150mm), 8" (200mm), 10" (250mm) and 12" (300mm) concrete core widths.



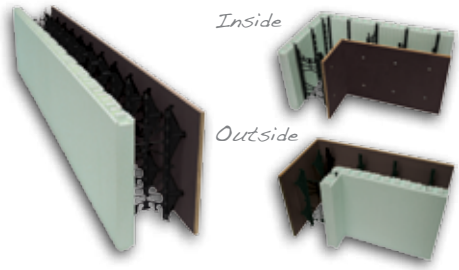
integrated series

The Integrated series from NUDURA combines building envelope products that work in conjunction with our line of Insulated Concrete Forms to provide maximum energy efficiency. The Integrated Series offers, RetroFit Insulation Technology (a 4' x 8', 1.2m X 2.4m sheet that installs inside and out), Floor and Ceiling Technology (insulation for floors and ceilings) and HYDROFOAM® (a radiant heat insulation base). Each Integrated Series product has been manufactured to install quickly and efficiently and replaces many traditional forms of insulation.

RetroFit NUDURA Insulation Technology · HydroFoam 360 · Ceiling & Floor Technology

one series

The industry's only multi-link form system that enables the creation of a fully exposed concrete surface that extends to the face of a standard NUDURA form panel. This offers builders and architects unmatched versatility for projects designed to use ICFs. At the core of this innovative line is our DURA MULTILINK Technology™, a newly designed web that enables the builder to create custom multi-sided form combinations for a variety of commercial and residential building projects.

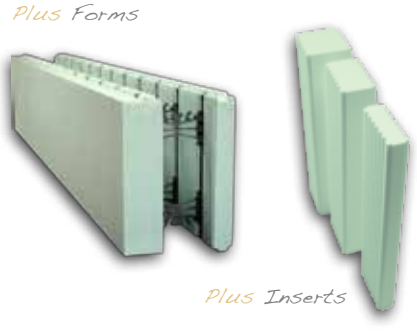


plus series

The Plus Series product line introduces an innovative way for designers and engineers to build their own R-value. The Plus Form and the R-Value Plus insert offers the ability to optimize R-Value with thermal mass to provide significant energy savings for building owners.

Plus Forms
- 1" (25mm)
- 2" (50mm)
- 4" (100mm)
- 6" (150mm)

Plus Inserts
- 2" (50mm)
- 4" (100mm)
- 6" (150mm)



6" (150mm) concrete core R-Value ratings based on exterior brick finish.

The combination of rising energy requirements and fuel costs means that we need to make the most of building technologies to heat and cool commercial structures and homes. NUDURA ICFs provide greater energy solutions for any structure. Ongoing laboratory and site testing has proven a home or commercial building built with NUDURA can reduce thermal transfer to as low as 1.9 BTU/ft2/hr (5.99 W/m2.k) even at temperatures as low as -11 deg F (-23 deg C). A NUDURA home or commercial buildings superior energy performance is the result of NUDURA forms working in conjunction with the thermal mass of a solid concrete core to provide one of the most energy efficient and airtight wall systems available today.

NUDURA Insulated Concrete Forms Contribute to LEED®

NUDURA supports Green Building Rating Systems, such as the Leadership in Energy and Environmental Design (LEED®) which is represented by a Green Building Council in an effort to provide a national standard for what constitutes a "green building". Specification of systems and materials that work together are key to achieving LEED® Certification. For a LEED® Credit Reference Guide that outlines credits associated with NUDURA Insulated Concrete Forms visit nudura.com.

LEED® Contributions: EA - Energy & Atmosphere MR - Materials & Resources IEQ - Indoor Environmental Quality

we'll LEED® you to sustainable solutions.

building a better future.

- **Recycled Materials** - NUDURA forms are manufactured from EPS (Expanded Polystyrene). NUDURA's unique folding web design is manufactured from 100% recycled polypropylene and steel.

- **Building Durability** - NUDURA forms offer a structure built out of concrete, one of the most durable building materials which result in buildings that stand the test of time. Building with NUDURA means high impact resistance and maximum safety in high wind areas.

- **Waste Reduction** - The unique 4-Way Reversible System from NUDURA creates less waste during the construction process, sending less waste to our landfills. All waste is 100% recyclable*.

- **Mold Resistant** - NUDURA forms have been laboratory tested and will not support mold growth unlike traditional wood frame structures providing healthier indoor living and working environments.

- **Energy Performance** - A NUDURA structure can reduce thermal transfer to as low as 1.9 BTU/ft2/hr (5.99 W/m2.k) even at temperatures as low as -11 deg F (-23 deg C). Building with NUDURA Insulated Concrete Forms reduces a building's operational energy demands, and as a result, the structure's carbon footprint on the environment.

- **Improved Indoor Air Quality** - The end result is an airtight structure that enables building mechanical systems to heat, cool and ventilate the structure more efficiently, creating a healthier living or working environment. NUDURA forms do not emit CFC's or HCFC's thereby improving indoor air quality.

**Subject to local recycling programs.*

service is our foundation for customer **satisfaction.**

technical support & customer service.

NUDURA's manufacturing team has been producing ICF forms for over 30 years and continues to play a leading role in developing the industry and in ICF technology. NUDURA aligns itself with the best companies in local geographic areas to provide extensive technical support and service. Distributors can offer installation recommendations to maximize efficiency and cost savings, provide up-to-date code compliance advice for local, regional, and national building codes, as well as product information and installation applications. **Call 866-468-6299** for customer assistance.

professional online tools & resources.

NUDURA makes the design process with the NUDURA Wall System as easy and efficient as possible. Our website provides valuable design tools and resources such as: a full BIM object & design details library, installation manual, brochures, videos, project photos, and more. Architects, contractors, and other design professionals can have access to industry leading technical support from NUDURA or an Authorized NUDURA Distributor.

Visit nudura.com/resource-center to access our resource center & design details library.

quality assurance.

NUDURA forms are manufactured in-house to allow full control over the manufacturing process, ensuring our forms are manufactured to the highest standards. NUDURA is audited quarterly by Warnock/Hersey which conducts regular plant inspections to ensure all aspects of NUDURA products are consistent. Our forms undergo rigorous testing everyday to ensure the quality is the same for every NUDURA product.

NUDURA Training Academy

Learn from our experience. If you are thinking of building with NUDURA Insulated Concrete Forms, we encourage you to take one of our One Day ICF Training Courses. The One-day training seminars provide Builders & Installers with basic NUDURA ICF installation skills. NUDURA is committed to providing the highest level of training, ensuring you get the knowledge you need to get the job done with efficiency and confidence.

The NUDURA Installation Course is led by a Certified NUDURA Installation Specialist and experienced ICF installer. Our trainers break down the ICF installation process, work through common building scenarios that arise in the field, and explain how NUDURA's unique line of accessory products help speed up the ICF installation process. Our trainers offer an open discussion style training seminar with a Q&A period.

We invite contractors, architects, engineers and design professionals to register today to learn more about the benefits of building with NUDURA.

To learn more about NUDURAs Training Academy or to locate a training course held in your area visit nudura.com/trainingacademy.

AIA continuing education programs.

NUDURA offers a variety of AIA Insulated Concrete Form courses for architects and design professionals, that qualify for Credits and Learning Units, and are presented on location. NUDURA is a registered provider of AIA Accredited Courses as part of a Continuing Education System.

AIA Accredited Course Available ONLINE

NUDURA also offers an Introduction to Insulated Concrete Forms course through Hanley Wood University in an easy to use online setting that allows architects and design professionals to earn Continuing Education Credits.

For a list of registered AIA Continuing Education Programs visit nudura.com/aia

CONTINUING EDUCATION
AIA

NET ZERO

Richardsville Elementary - Bowling Green, KY - First Net-Zero Insulated Concrete Form School in the U.S.
Designed to use only 18 kBtu/sq. ft.- 75% less (annually) than the ASHRAE 90.1 Design Standard for elementary schools.

© CMTA Engineering Consultants *Architects: Sherman-Carter-Barnhart*

Buildings have a significant impact on energy use and the environment. Commercial and residential buildings account for 40% of the primary energy and approximately 70% of the electricity in the U.S. In fact, the construction industry consumes more energy than the industrial or transportation sectors. The U.S. is responsible for 20% of the world's carbon dioxide emissions, with U.S. buildings' energy use responsible for 8% (U.S. DOE 2009).

Once thought of as building methods of the future, has now arrived. Buildings are now being constructed to a new standard known as Net-Zero. Net-Zero structures maximize the use of on-site renewable energy, thereby producing more energy than they consume over the course of a year. NUDURA's superior building envelope is a key element in achieving Net-Zero construction by creating an airtight structure that significantly reduces the flow of heat through the wall due to the thermal mass advantage NUDURA forms provide. The NUDURA Wall System allows mechanical equipment to run at optimal levels to provide maximum energy performance, resulting in greater cost savings throughout the year.

Projects specifying NUDURA Insulated Concrete Forms provide much greater potential for saving valuable environmental resources, reducing energy consumption and C02 emissions; a few key factors facing today's commercial and residential buildings.

Hear from the Architect and Engineer behind this high performance school, watch our Richardsville Elementary video at nudura.com/netzero.

residential



commercial



© Enermodal Engineering

© CMTA Engineering Consultants

multi-storey & hotels



educational & medical facilities



© CMTA Engineering Consultants

Visit nudura.com/photo-gallery for more photos.

Code & Testing Compliance

NUDURA products (when installed per Code requirements) have been designed, tested and approved to comply (i.e. meet or exceed minimum compliance benchmarks) set by all the following applicable Codes Standards and Evaluation Criteria for the use in both combustible and non-combustible construction for all types of building occupancies and construction types.

code compliance evaluations.

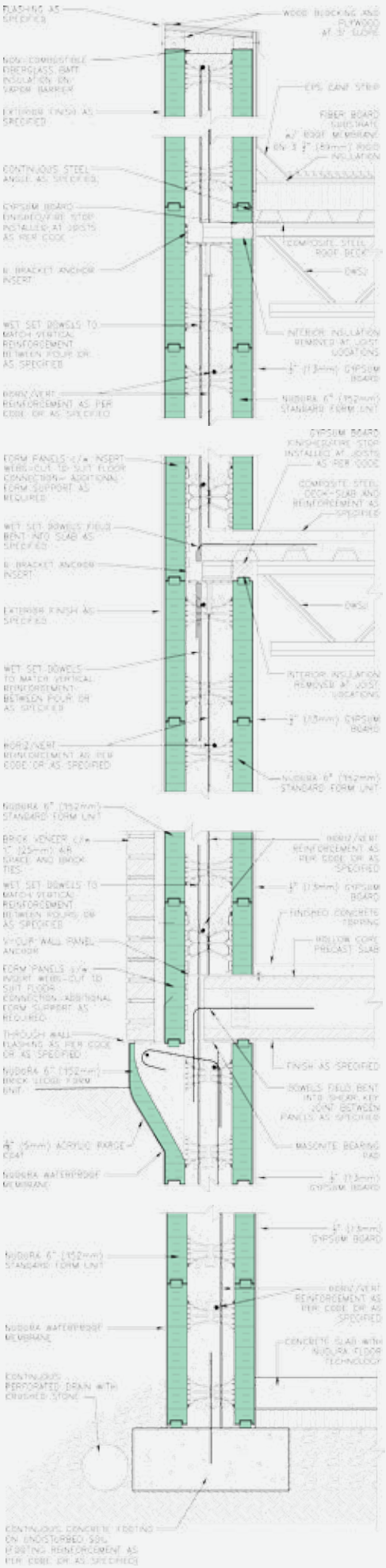
Canada:	National	Certification to CAN/ULC S717.1 - Intertek SPEC ID 29103
	New Brunswick - NBFMO:	File: 3955 - Compliance to 82-20
Europe:	European Union (BBA):	ETA-07/0034
USA:	National - ICC-ES:	ESR-2092
	Florida - BCO:	FL1585-R
	Miami Dade County - BCCO:	NOA No. 11-0720.02
	Wisconsin - DOC S&BD:	200427-1
	New York City - OTCR:	Complies with BB 2009-020
	Los Angeles:	RR25595

testing standards and compliances.

- **Form EPS Foam** certified to meet ALL requirements of ASTM C578, ASTM E2634 (USA) / CAN/ULC S701, S717.1 (CAN)
- **Structural Design** NUDURA forms structurally reinforced flat uniform thickness monolithic concrete walls:
  - **Engineered Design:** USA per ACI 318, CAN per CAN/CSA A23.3
  - **Prescriptive Design:** USA per R404, R611 IRC 2006/2009, PCA/EB 118 / PC-100-2007
    : CAN per NBC 2005, Sections 9.15 and 9.20
    : NUDURA Installation Manual Structural Tables per Appendix D & E
- **Fire Resistance Testing** per UL-263/ASTM E-119 (USA) and CAN/ULC S-101 (CAN)
  - 6 inch (152 mm) Core & above : 4 Hours
  - 4 inch (102 mm) Core : 2 Hours
  - UL Classified: BXUV.U930 (USA) / UL Listed: BXUVC.WO12 (CAN)
- **Assembled Thermal Resistance/Conductance**
  - R 23.59 (RSI 3.94) /U Value : 0.2538 W/m2.K
  - Based on Standard Finished 6 inch (152 mm) Core Form calculated to ASHRAE Handbook of Standards and confirmatory testing of EPS to ASTM C518 (USA & CAN) & ISO 8301 (EUR)
- **Wall Assembly Sound Transmission Classification**
  - STC 50 (RW 50) minimum for Finished 6 inch (152 mm) Core Walls and above
  - Testing per ASTM E336 (USA/CAN)/ ISO 140-4 (EUR)
- **Wall Assembly Vapor Permeance**
  - Inner or Outer Panel (EPS) Foam qualifies as a vapor barrier when tested to ASTM E-96
  - 0.624 Perm-Inch (36 Ng/Pa.s.m2) for 2 5/8-inch (66.7mm) thickness of EPS Foam
- **Thermal Barrier Protection Testing**
  - Standard 1/2 inch (12.7 mm) Gypsum board qualifies as a Thermal Barrier as per code requirements
  - Gigacrete Plastimax coatings qualify as a Thermal Barrier per listings as specified by Gigacrete (USA only)
  - Tested/Comply with NFPA 286 (UBC 26-3) (USA) & CAN/ULC S-101 & CAN4-S124 (CAN)
- **Fastener Withdrawal and Shear Resistance**
  - Various screw fasteners tested for both Lateral Pullout Withdrawal and Vertical Shear
  - Testing conducted per ASTM D-1761 (Test results available from www.nudura.com)
- **Flash Ignition/Self Ignition Testing – EPS Foam**
  - Flash Ignition Temperature - 698° F (340° C)
  - Self Ignition Temperature - 806° F (430° C) Tested per ASTM D-1929
- **Flame Spread and Smoke Developed Indices –EPS Foam**
  - Flame Spread Index 5* (USA) 180** (CAN)
  - Smoke Developed Index 200* (USA) over 410** (CAN)

  *From UL file no. BRYX.R4775 **From ULC File no. BTLIC.R4775. Used by permission of NOVA Chemicals INC
- **NUDURA System Approved for Types I through V Construction (USA)+ and for Non-Combustible Construction (Part 3 Design) (CAN)+**

  +When exterior EPS foam finished with approved non-combustible finishes (consult NUDURA for details)



NUDURA ICFs: COMPLETED IN 6 BUILDING STEPS

Step 1:

Prepare footings for block

Step 2:

Stack forms & create openings

Step 3:

Place rebar in the walls

Step 4:

Align wall for concrete pour

Step 5:

Pour concrete into walls

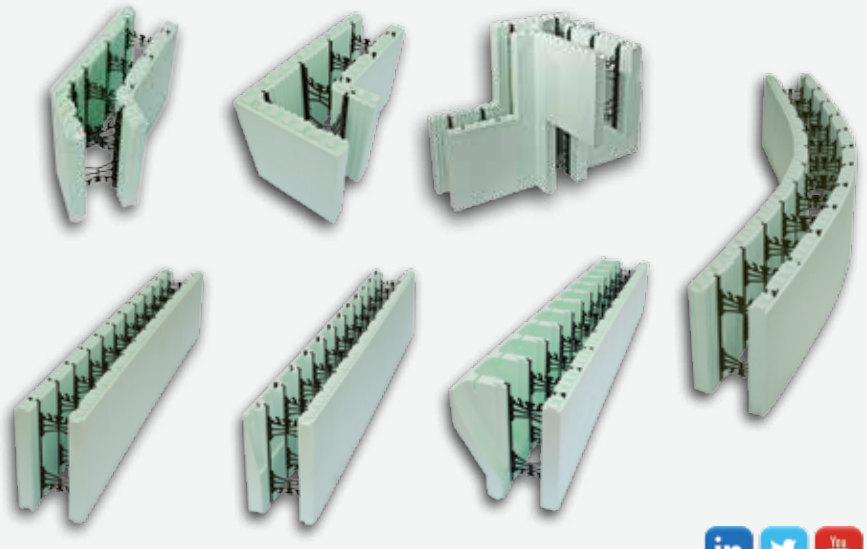
Step 6:

Install electrical, plumbing & roof

For more details, drawings and information about the installation of NUDURA ICFs download the NUDURA Installation Manual at nudura.com/installation.

Download the most recent copy of the NUDURA Product Guide at nudura.com/brochures.

NUDURA INSULATED CONCRETE FORMS

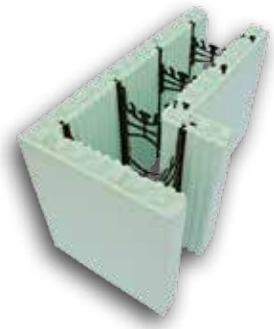
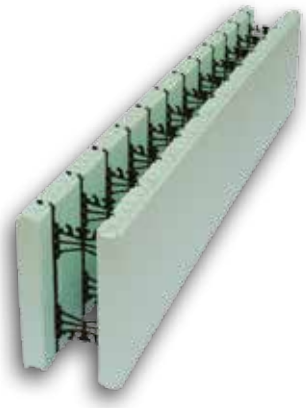


Follow us on:

NUDURA®
INTEGRATED BUILDING TECHNOLOGY
Building Value

Over 50 years of building experience.

By using NUDURA Insulated Concrete Forms to build your next structure you can ensure you are choosing the best building solution available today.

LISTED INSULATED CONCRETE FORMS 27WY

CICFI COUNCIL OF ICF INDUSTRIES

The performance claims referred to in this Brochure are based on a comparison between a typical 8' (2438 mm) high NUDURA wall with a 6" (152 mm) core, properly built to the National Building Code of Canada (NBC) and installed in accordance with NUDURA Corporation's specifications and a typical 8' (2438 mm) high 2" x 6" (50 mm x 152 mm) wood-framed wall insulated with R20 batt insulation, properly built to NBC and with regard to "fire resistance" on ratings listed in the NBC, with regard to "sound resistance" on ratings listed in the NBC and in the study "Insulating Concrete Forms, with regard to "durable" and "comfort" on an independent analysis and with regards to "energy efficiency" in the study "Energy Consumption of Concrete Homes Versus Wood Frame Homes" published by the Portland Cement Association. Such performance claims may vary depending on certain atmospheric conditions and geographic locations. STC Ratings are based on a 6'(152 mm) core form and greater. Note: 4'(102 mm) form is not to be used as a suite or corridor separation wall, except as specified by NUDURA. For further details or questions please contact NUDURA.