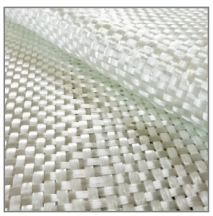
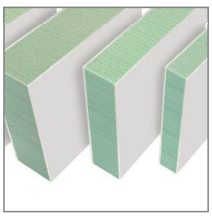
ANNEXAIR

Biocomposite Technology

17/05/22

Life antimicrobial product protection





Metal-Free casing elevating sustainability through a hygienic approach

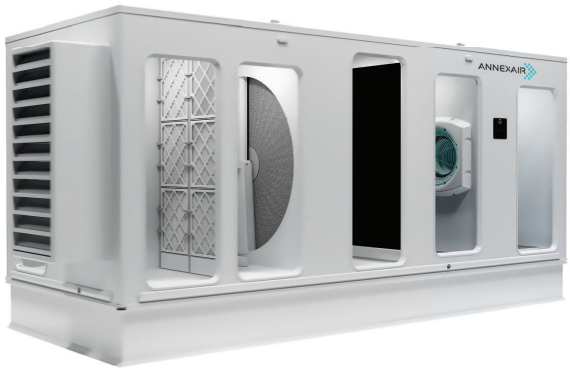
RIADA

WELCOME TO ANNEXAIR

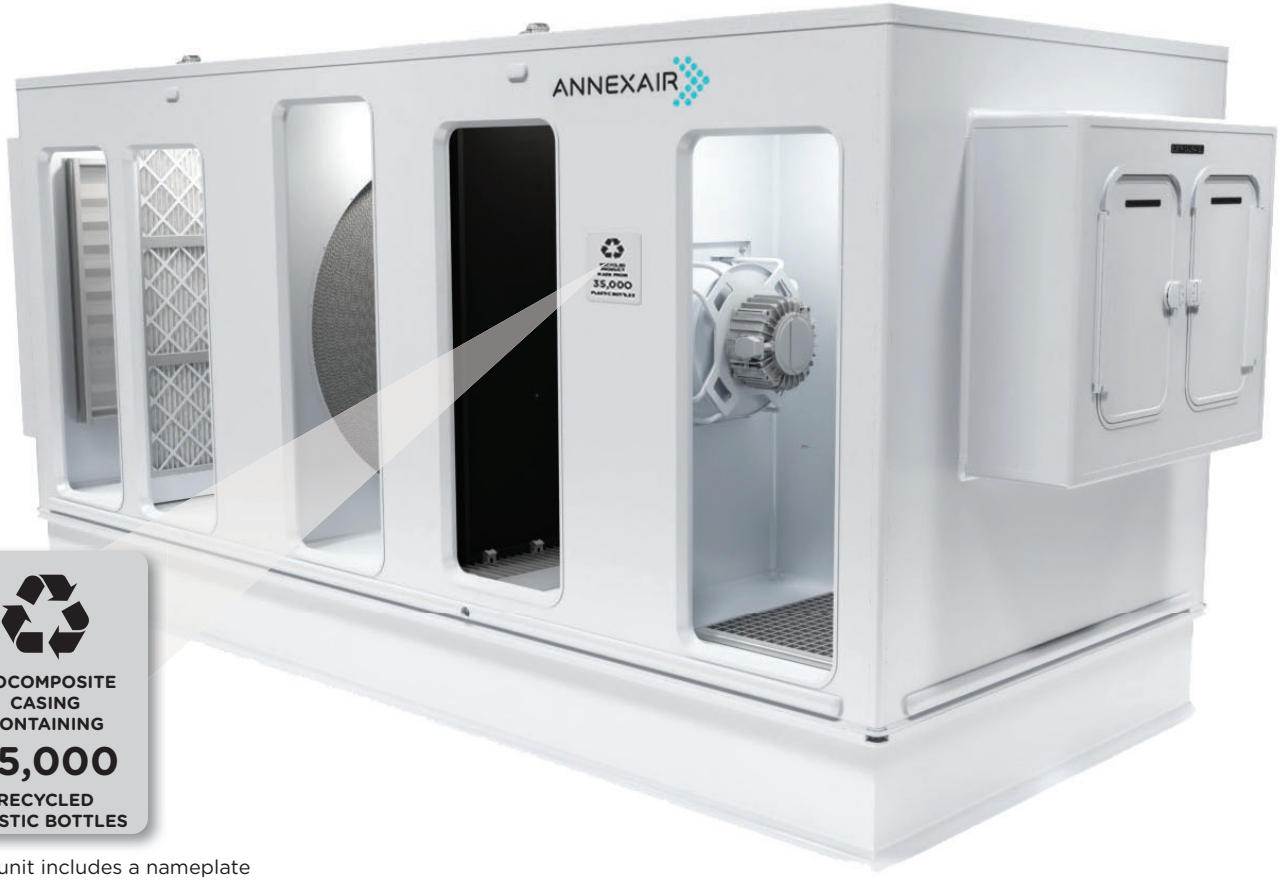
BEYOND JUST A BOX

A long time ago, we understood that the design of HVAC systems needed rethinking, and that this would only be achieved with the arrival of new advanced materials. Our biocomposite technology, combined with elements made from new types of high performance engineered composite, has enabled us to create a finished product with a superbly esthetic look. This groundbreaking product could not have been achieved using metal.

We have focused on the small details and made no compromises. In addition, our rounded shapes have resulted in a modern look in contrast to the traditional plain and square metal box. We are proud to rejuvenate and modernize the HVAC industry which, let's admit it, has been very conventional since the start.



Typical outdoor wheel unit with C/W coil and our new EC-Spider fans



BIOCOMPOSITE CASING CONTAINING

35,000

RECYCLED PLASTIC BOTTLES

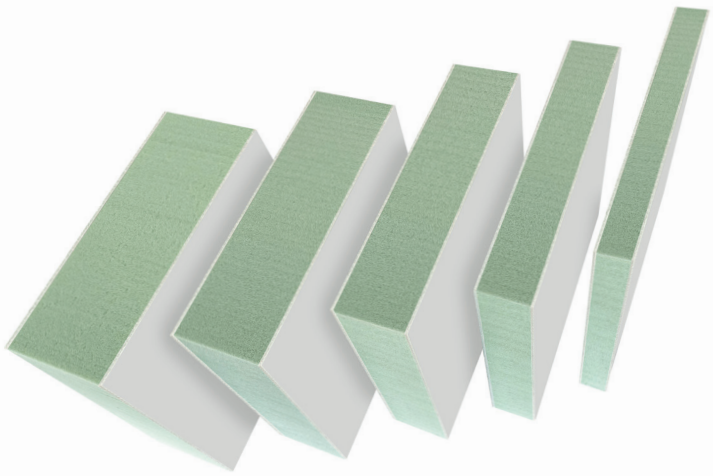
Each unit includes a nameplate showing the quantity of bottles re-used for its insulation fabrication

FINALLY: AN ALTERNATIVE TO METAL CASING HAS NOW ARRIVED!

In 2012, we launched our first generation of thermo-composite systems, which is still a huge success. Today, we are repeating this achievement with our second-generation casing, which will be by far the best and the greenest in our industry.

One of our main innovations is the use of recycled plastic bottles which are transformed into high-performance insulation. When compared with other insulating materials currently used in our industry, this foam insulation is considerably superior, particularly because of its thermal properties, incomparable rigidity, stable energy performance over time, and sound absorption.

For example, a medium-sized Annexair system can require 40,000 bottles, while a large system may contain up to 250,000 bottles. Yearly, 50 million bottles will be reused for the production of our system which may double in a few years. As result, we will contribute to the circular economy by giving a second life to 100 million plastic bottles.



In-house made panels comes in 5 different thicknesses. Depending on unit size, floors may use either 3", 4" or 5" thickness and the housing may come either in 1", 2" or 3" thickness

A MASTERPIECE IN SUSTAINABLE HVAC ENGINEERING

Annexair has always been responsive to the cause of climate warming; therefore, we have prioritized the development of innovative products that respect our planet. Today, acting to reduce the impact of climate change has become a matter of urgency.

In the wake of COP 21 in Paris, we set ourselves ambitious environmental targets aimed at reducing climate damage and enabling us to live in a better world. These objectives concern not only the energy performance of all the HVAC systems we manufacture, but also methods and materials used in designing and manufacturing the casing itself.

In America, a profound shift is currently taking place: environmental responsibility is taking hold, encouraging all businesses to rethink their range of products. This is the new face of America, and we at Annexair have decided to join the movement and take action. How will we do this? By becoming leaders - the first in the world to market HVAC casings made 100% from biocomposites, with no steel used in their manufacturing. This will lead our industry into a new era. The HVAC system of the future is here, and we created it.

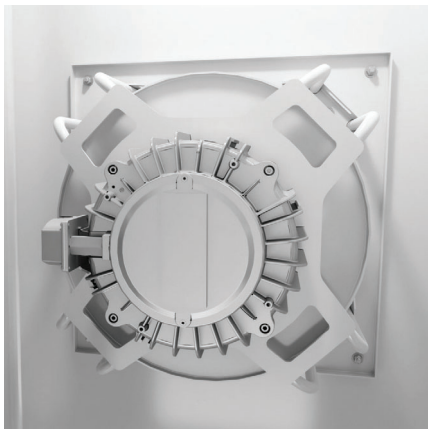
The result of eight years of R&D and several million dollars of investment, this revolutionary new generation HVAC casing will radically change the basic rules and will set a new standard for comparison between the various manufacturers in our industry.

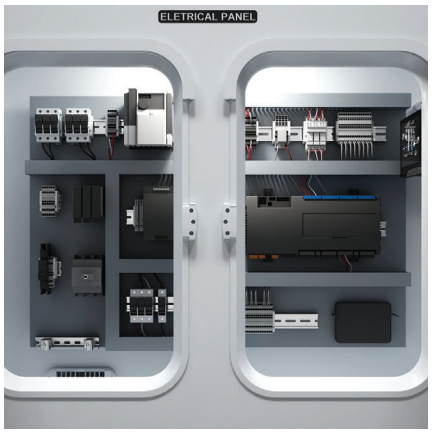
This new generation casing responds all the wishes expressed by building owners, consulting engineers, contractors, and service / maintenance personnel. They want to see a product that combines sustainability, environmental responsibility, longevity, lightness, hygiene, ease of maintenance and, naturally, an affordable price.

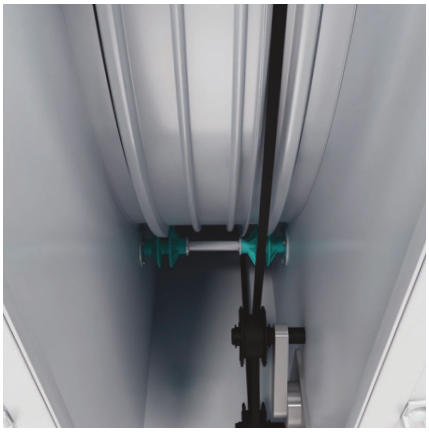
This is what we offer.

Our innovative system is the ultimate solution:

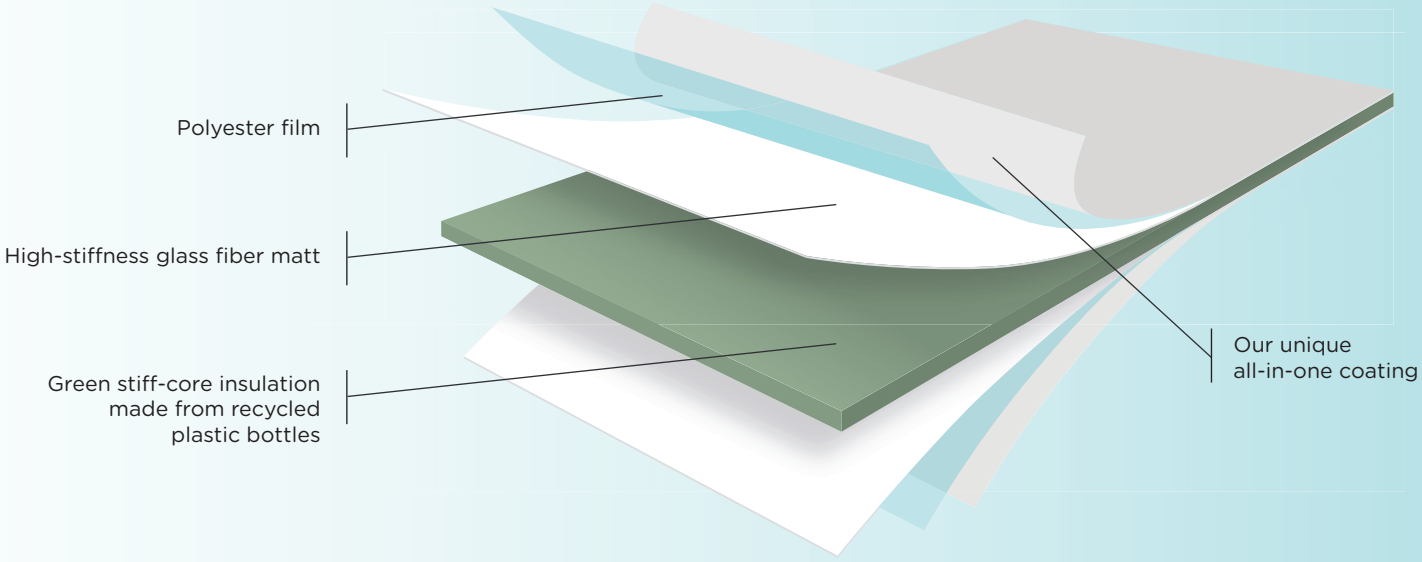
- The first 100% metal-free casing construction, no matter the size
- Zero metal, zero thermal bridge, zero condensation
- Innovative green stiff-core insulation made from recycled plastic bottles thanks to Biosourced Reinforced Engineered composite panels
- Rust is impossible due to the absence of steel
- 40 to 60% less heavy than a steel casing
- Super high stiffness casing that makes L deflection @ L/1400
- Life® antimicrobial coating for all inside and outside casing panels including all unit polymer parts
- Bathtub-style round edge floor corners for easy cleaning and for hygienic purposes
- Extra UV protection against outdoor chemicals and environment pollutants
- Seamless panel construction providing an unmatched smooth finish everywhere in the box
- Annexair's new multi-point latch handles
- Single, double or triple EPDM door gasketing adapted to unit pressure operational design
- Seamless dome roof panels no matter the unit width and length, a 100% leak-proof roof
- 1/8'' thick self-levelling floor sealer poured in each unit section, a 100% leak-proof floor







WHAT IS ANNEXAIR BIOCOMPOSITE



Our engineering team devoted many years of research to calibrate the perfect marriage between glass fiber geometry, stiff-core insulation density and our bio-sourced matrix formula.

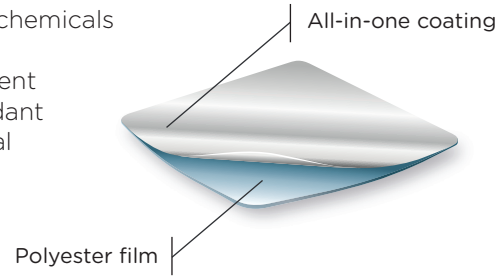
Annexair's in-house manufacturing process, helped by our custom-made hot presses, allows us to build extremely large panels in one piece. Our largest panel can be up to 13 feet wide by 45 feet long in a single piece without any seams produced in 5 different thicknesses. Each panel is individually pre-made, trimmed and laminated with a film before being placed onto the assembly lines.

Annexair is the only HVAC manufacturer that goes that far with respect to the unit treatment protection.

Our unique all-in-one coating

All annexair panels are laminated using a Polyester film which also include our unique all-in-one coating. This UV-cured last coating is applied on the entire casing and includes protection against:

- All outdoor chemicals
- UV sun rays
- Water repellent
- Flame retardant
- Antimicrobial
- Anti-graffiti



Recycled plastic bottles

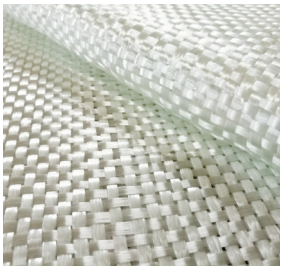
Innovative green stiff-core insulation 100% made from recycled plastic bottles, especially developed for one-shot curing processes

+

Green chemistry

Bio-sourced bonding matrix made from organic waste landfill brings results in high flexural stiffness, safer work and an eco-friendly production process

+



Glass fiber

Glass fiber matt manufactured in house, specially weaved to satisfy the highest HVAC casing stress

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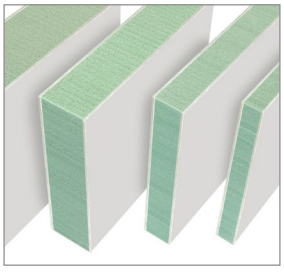


Biocomposite panels

"Engineered Bio-Sourced Sandwich Composite Panels," we have shortened this to biocomposite panels

Our concept is inspired from the high-speed trains industry, where each wagon is built with very long composite structural panels bonded together. This precise mechanical assembly creates a super strong square box when all bonded together.

12 x 45 ft biocomposite panel made from 16,000 recycled plastic bottles

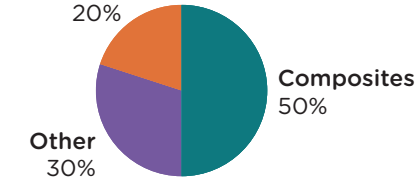
	MOST COMPETITORS	ANNEXAIR GEN 1	ANNEXAIR GEN 2
GENERAL FEATURES	**G-90 GALVANIZED STEEL**	**THERMO-COMPOSITE**	**BIOCOMPOSITE**
CARBON EMISSIONS	High	Medium	Low
CORROSION RESISTANCE	Medium	Good	Excellent
CASING RUST	Medium-High	Minor	Not possible
WEIGHT FACTOR	1	0.6	0.6
FOAM INSULATION TYPE	Polyurethane	Extruded XPS	Recycled Plastic Foam
R-VALUE (Thickness)	R-12 (2")	R-14 (2")	R-14 (2") or R-21 (3")
FLAME / SMOKE INDEX	25/50	25/50	25/50
LEAKAGE RATE	Class 6	Class 6	Class 2
PANEL DEFLECTION	L/240	L/1150	L/1400
THERMAL-BRIDGE	Medium-High	Low	None
WASH DOWN	Complex and costly	Optional (wipe down)	Standard
FINISH (EXT./INT.)	Painted/G-90 Non-painted	Painted/Painted	Polyester Film - UV rated
ANTIMICROBIAL COATING	None/Costly	Mid/Costly	Standard

WHO ELSE USES COMPOSITES?

Composites are widely used for engineered products in every kind of industry. The Annexair internal staff who developed our biocomposites come from the Aircraft and Aerospace industry and have worked in the past on multiple projects like The International Space Station. This explains why Annexair has a strong internal expertise in Advanced materials such as composites and others.

The benefits of composite materials include superior strength-to-weight ratio, structural stability and durability. They do not absorb moisture and have excellent resistance to extreme thermal conditions. Unsurprisingly, more and more manufacturers are integrating composites into their products today. At Annexair, we enjoy saying that biocomposites are the future.

Boeing 787 aircraft uses 50% composites and the Airbus A330 uses 58% composites



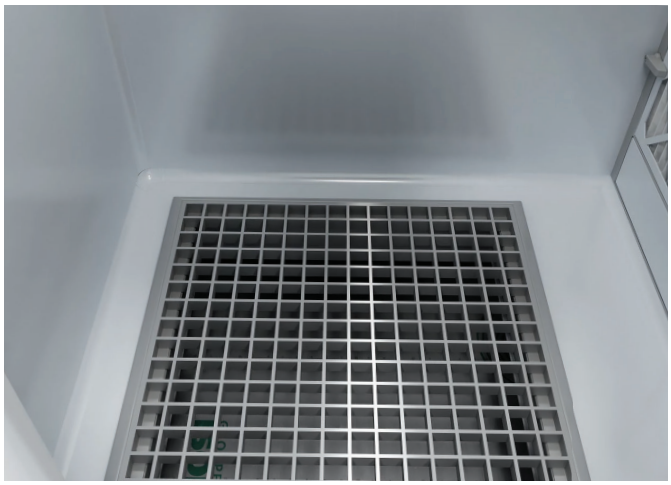
Examples of other sectors using Advanced materials such as composites

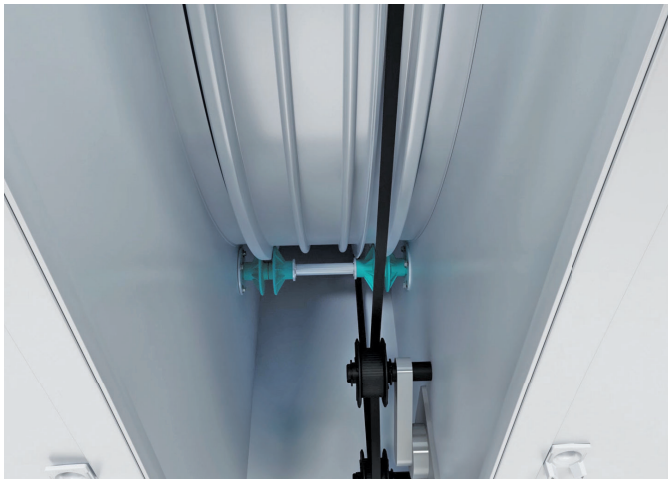
THE TIME TO REWRITE SPECS HAS ARRIVED!

In the wake of the pandemic, ventilation systems and their distribution have become more crucial than ever as factors for building hygiene. In this “new normal,” every air handling unit should provide permanently clean air.

The system should be easy to clean, and include effective antimicrobial coating. With our new series, we are introducing a new level of hygiene to prevent occupants from being endangered by microorganisms.

Careful attention was given to all internal partitions and specifically to floor edge corners by developing a bathtub round edge floor concept. It is not only for aesthetics but is especially practical to fight against the accumulation of direct and micro-oganisms in tight areas. According to us, the time to rewrite the industry’s specifications has arrived.





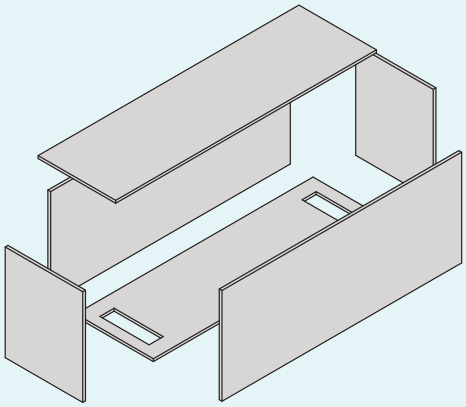
SMARTER ASSEMBLY CONSTRUCTION

There are many benefits to making large single-piece panels. One of the main advantages is the ability to assemble units much faster. Our knock-down factory process, combined with our large CNC machines, allows us to cut each panel in a very precise way for a perfect connection with other panels. It is similar to the concept of pre-fab homes, where each part is designed to connect firmly with the others. Unit assembly is quicker, simpler and extremely airtight. Leaks are almost impossible.

The most significant benefits come next. Once all the precision-cut panels, including the roof, are connected together and bonded with adhesive, it creates a super-solid, mono-shell/unibody composition structure. All the panels, including internal partitions, become cemented, immovable and fixed firmly in position. The whole process could not be simpler.

Monoshell Casing Fabrication (Annexair)

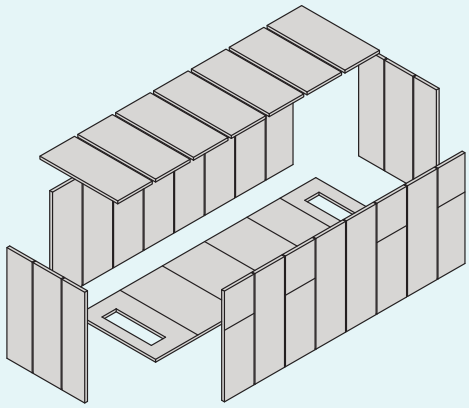
Required panels: **6**



VS

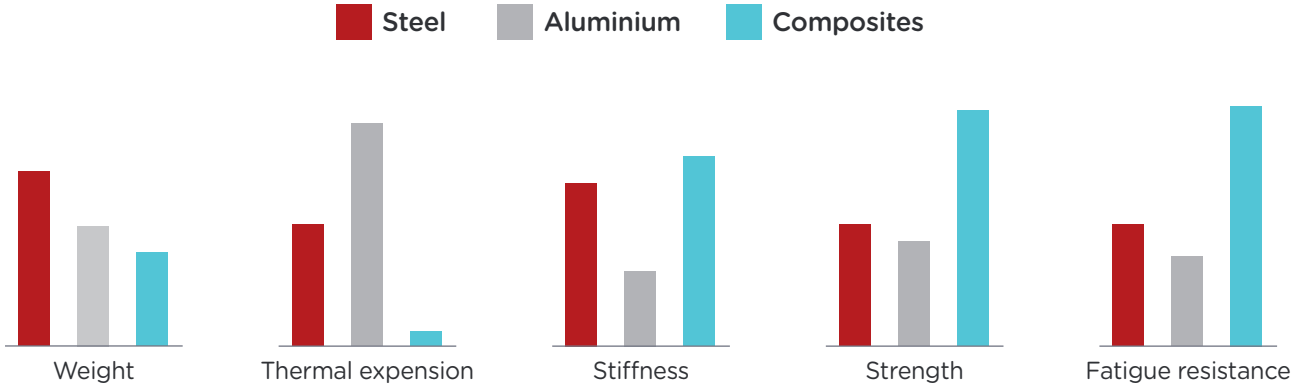
Multi-Panel Casing Fabrication (Conventionnal)

Required panels: **39 x 2 = 78** (13X more)



The illustration above shows the difference between Annexair biocomposite monoshell fabrication versus traditional multi-panel fabrication for a typical standard unit. As shown, the left image required less panels by a ratio of 1:13 versus the image on the right.

Comparison of physical and mechanical properties

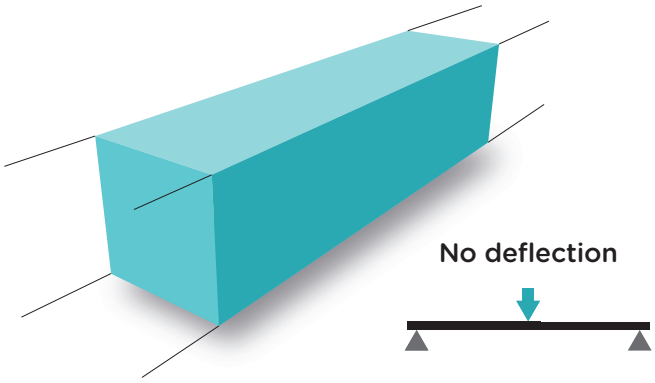


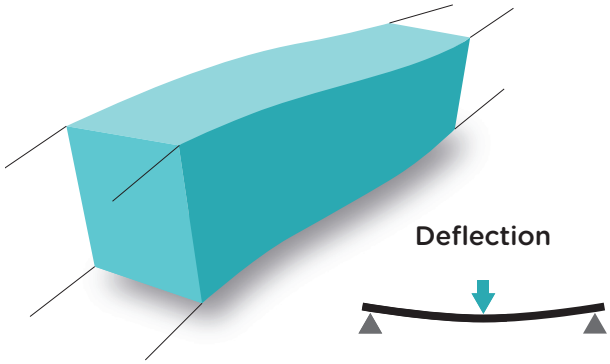
The illustration above compares the physical and mechanical properties of steel, aluminum and composites. As shown, using composites provides more benefits than the other materials.

Monoshell casing (Annexair)

VS

Multi-panel casing (Conventionnal)





- Drastically reduced quantity of parts to be fabricated, ratio of 1:13
- Fewer parts means more efficient, quicker assembly, less errors and less waste
- We always need only 6 panels for the entire assembly
  - 4 panels required for unit sides
  - 1 panel for the floor
  - 1 panel for the roof
- Formed channel framing system is no longer required, because there is one panel
- All internal partitions are made with the same panels
- Industrial grade bonding is used and acts as an adhesive and seal simultaneously, pratically screwless unit assembly
- Absence of conventional panel seams eliminates possible leaks
- Floor is made of one large single-piece panel
- Unit stiffness exceeds by 10X multi-panels casing
- Hygienic construction is simpler and economical
- Longer lifetime corrosion resistance warranty

Unit rigidity is obtained when all the panels are bonded and fixed together

- Higher complexity method requiring more labor
- Hundreds of sheet metal panels must be manoeuvred individually into the factory
- Each panel creates the risk of air gap leaks at each bent panel corner
- Hundreds of punched holes and screws are needed
- A large amount of caulking must be applied to fill gaps between panels
- Unit caulking may crack during transportation and over time due to thermal expansion
- Air tightness of the unit depends on the quality of the caulking applied outside the casing
- Gaps create weak and delicate assembly unit
- Structural unit frame may cause air leaks at cross-member jonctions
- Thermal break unit is complex and costly
- High risk of condensation in many unit sections
- Metal chips will produce rust dots when unit is not properly clean
- White powder stain may appear on the G90 surface
- Metal unit will rust over time
- Hygienic construction is complex and costly
- Numerous lifts are necessary, however rarely used while rigging allowing unit to bend
- Traditional paint generally does fade

100% ANTIMICROBIAL CASING WILL BE OUR NEW NORMAL

AVAILABLE STARTING FROM SPRING 2023

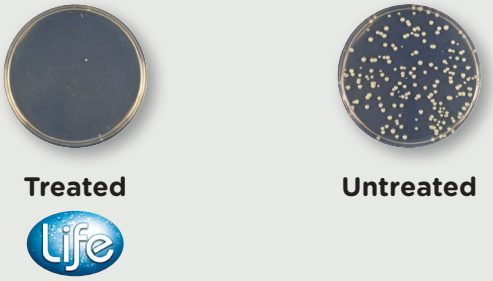
Since Covid-19, many building owners in America have dreamt of upgrading their HVAC systems to ones that are made better, more resistant to mold and moisture and offer more protection against the spread of microorganisms, such as bacteria.

Annexair responded to this matter and decided to take the lead in the HVAC industry by offering this as a standard feature. To do so, we partnered with a cutting-edge Antimicrobial manufacturer, Life Material Technologies company, which is a leader in this industry.

The additive selected by us is the antimicrobial technology Life® product. This additive remains inert until it comes into contact with a damp environment in which bacteria can rapidly grow. Only then will it release minute amounts of silver, disrupting the bacteria's metabolism by preventing it from converting nutrients into energy, which inhibits bacteria survival, reproduction and colonization. This long-lasting protection works around the clock to inhibit the growth of microbes. It complies with NFPA 90A, ASHRAE 62.1, EPA and others.

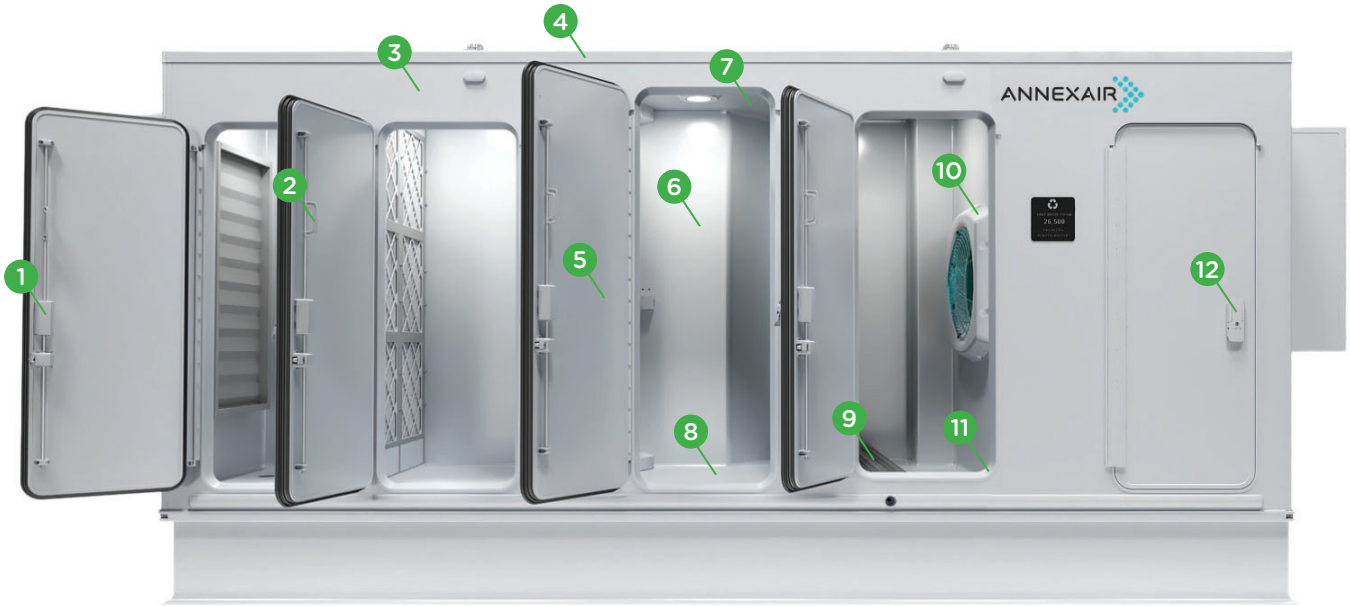
The Life® antimicrobial technology has been incorporated into all Annexair injection moldings, all extrusions and all biocomposite panels surface coating. It includes an excellent broad-spectrum antibacterial activity, long term stability, non-soluble, non-melting, non-combustible, thermal stability and safe that people can touch and come in contact with.

BACTERIA POLYMER SAMPLES COMPARISON



Treated **Untreated**

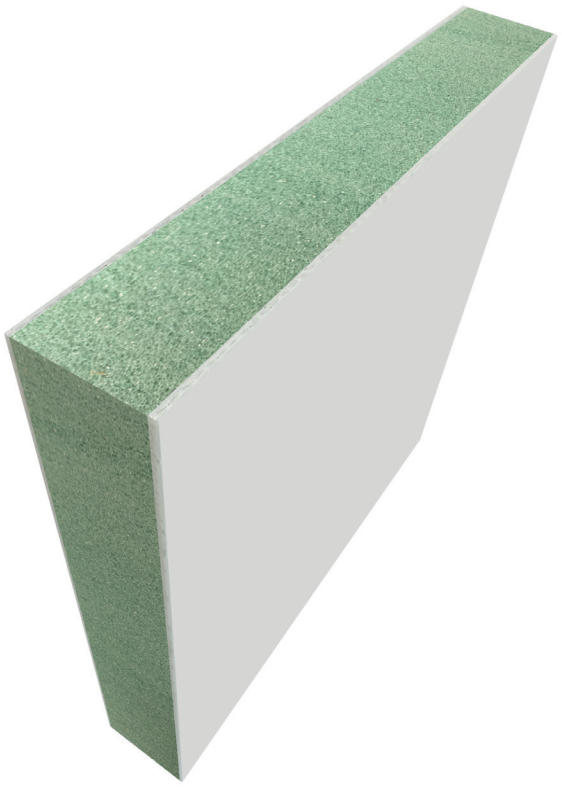
The green color bullet below represents areas which are treated with the Life® antimicrobial additive.



1- Plastic door mechanisms
2- Inside door handles
3- Exterior walls
4- Plastic mouldings
5- Inside walls
6- Inside partitions
7- Ceiling surfaces
8- Unit floor sealant
9- Drain pan
10- Fan inlet
11- Door trims
12- Exterior handles

BUILT TO FIGHT OUR WORST ENEMY: UNIT CONDENSATION

With the extreme weather conditions that now occur in North America, the risk of condensation inside or outside the casing is rising. Poor casing construction and assembly can lead to thermal bridges even if a thick thermal insulation has been used. Therefore, the quality of the thermal decoupling for the entire shell structure plays a decisive role. Our new system eliminates thermal bridges which is the cause of AHU condensation.

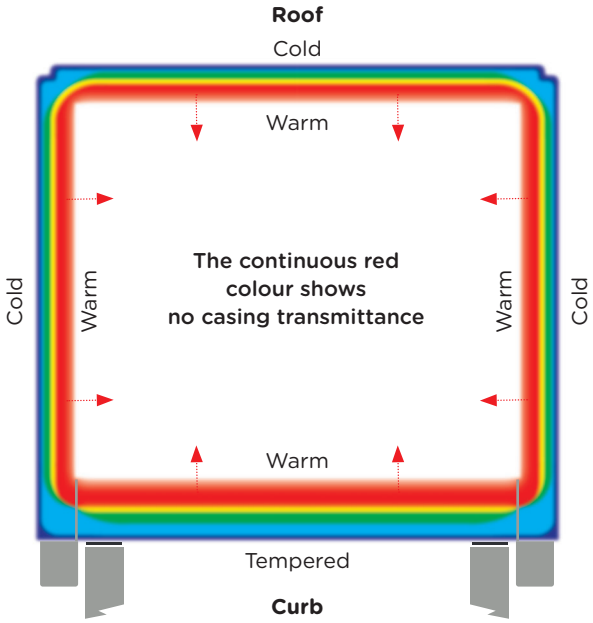


Zero metal = Zero thermal bridge = Zero condensation

Besides the fans, motors, coils, electrical components and other HVAC components normally found in air handlers, the only steel part that we have in our casing are our lifting lugs. This means that the entire body casing, including the floor, has zero metal sheets or steel beams. Even our drain pan is not made from traditional stainless steel but is instead made from composite which generates zero condensation even in tropical conditions.

Our engineering team has meticulously concentrated their work on the thermal conductivity between each unit component.

From Colorado in winter to Houston, Texas in summertime, we are totally convinced that our product will meet the worst temperature conditions in both places without any condensation anywhere in the box.



Thermography view of our biocomposite casing: Rooftop example in a winter simulation

PERSONALIZED THE EXTERIOR

At Annexair, we have a reputation for making things differently since day one. Now, we continue to keep up our reputation by offering different options for your unit finish.

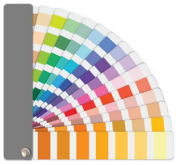
The standard factory exterior unit color is light grey, as shown below. For some projects, if the customer wants to wrap unit exterior with a building fascia look, Annexair will be able to do it. The wrap for fascia reproduction consists of a imagery that gives the illusion of the real fascia selected.

Instead of a traditional spray paint process, Annexair uses a super-wide digital printer to color our industrial Polyester film. With this machine, we have almost no limitations on printing possibilities.

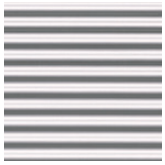
Exterior finish options

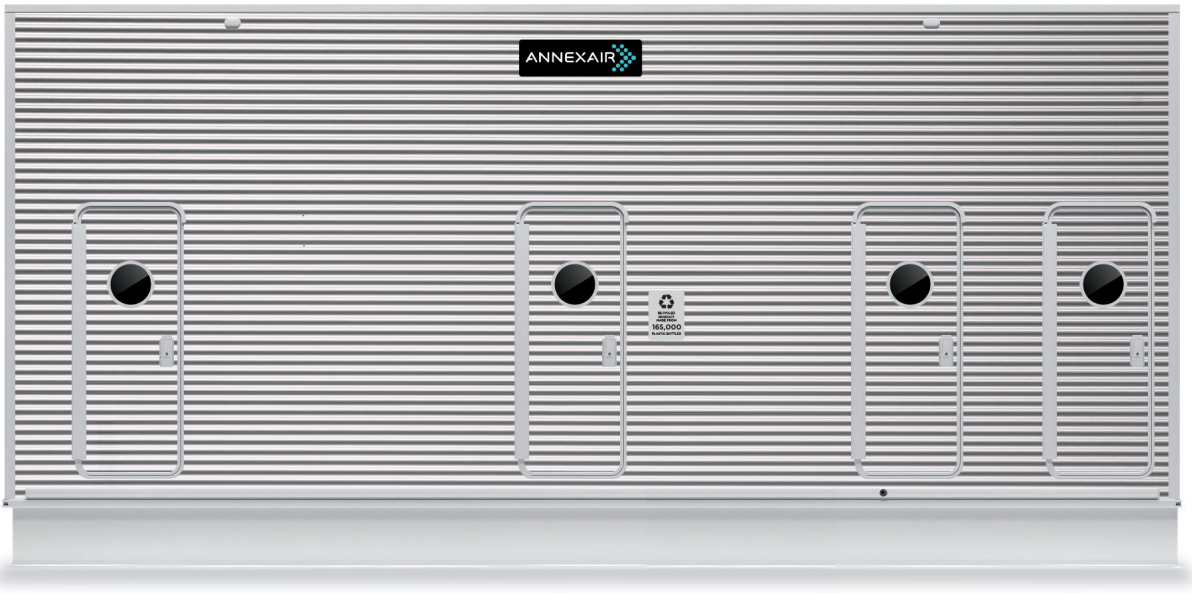
Standard Color

$/ Custom Color



$$/ Fascia reproduction



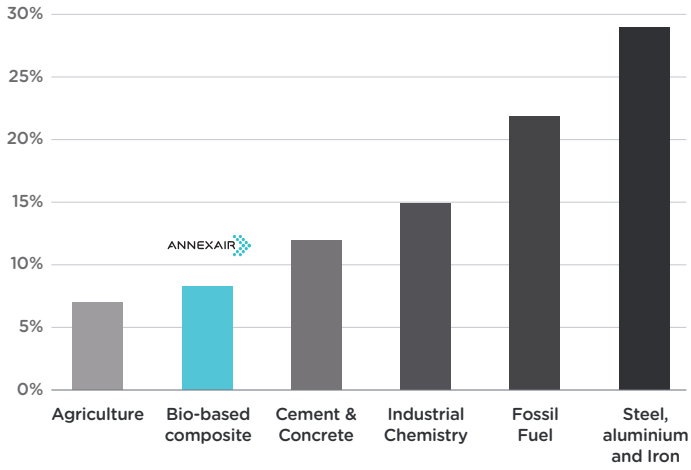


Example of a 20,000 cfm ERU with a corrugated metal look reproduction

PROACTIVE FOR A GREENER PLANET

When you choose a Biocomposite unit from Annexair, you contribute to the global Reduce–Reuse–Recycle movement. Global warming is an urgent crisis and strategies to reduce CO^2 levels should be a priority for all. Sustainable products need to be made with respect for the planet's biodiversity, meaning that environmentally friendly production processes should be used throughout the life cycle of a product. Our new casing series has the lowest carbon footprint by far due to the absence of metal.

CO^2 Emissions by industry sector



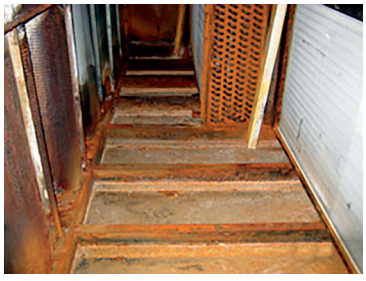
In America, steel and aluminum industry processes are one of the largest producers of CO^2 emissions. We understand that our society cannot do without steel, but eco-friendly products that produce less CO^2 emissions should at least be specified as a priority. This is what we believe and what we offer.

Smarter investment

One of the main advantages of our Biocomposite technology is obviously the long service life before a unit needs to be replaced, resulting in substantial savings for any building owner.

Let's talk about the service life of our casings. If a yacht built using similar construction methods can withstand salty seas for 30 to 35 years, then our systems, mounted on a building roof where there is no salt, should last for at least 40 to 50 years. This means 2 or 3 unit replacements where building owners do not have to replace.

1976 SeaRay Vintage boat, still looking great after 45 years in the sea, made of the same type of glass fiber of our biocomposite casing



Rust results deterioration both outside and inside the unit casing

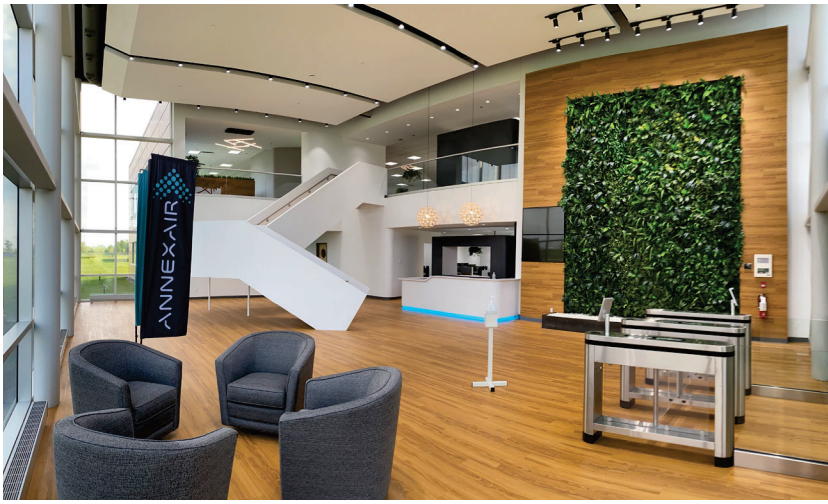
MOVING INTO OUR NEW FACILITY

Our new Biocomposite series will be produced at our new state-of-the-art smart factory in St-Germain-de-Grantham. The new facility, which was delayed due to the pandemic, is a 10-minute drive from our existing plant in Drummondville, Quebec. The building is 370,000 sq. ft. and sits on a 2 million sq. ft. of land.

The plant's architecture is in line with the new eco-design trends that promote employee well-being while keeping the planet in mind. The eco-production process includes a number of important elements: most of the waste will be recycled, raw components will have zero or low VOCs and chemical products are kept to a minimum. The plant will be paperless and many other green principles will be adhered to.

Abundant natural light is one of the main characteristics of the building with more than 75,000 sq. ft. of windows with 45 large skydomes measuring 5 ft. x 25 ft. each. On a clear and sunny day, we can turn off most of the factory lights. It is fully air-conditioned, with some of the new Annexair air-source heat pump systems including superior filtration to keep ambient air healthier.

To provide a natural and warm environment, all the factory interior walls have been covered with natural wood siding, green plants with large green walls are also integrated.



Main lobby

In-house cafeteria with hot meals served

View of offices and conference rooms

Robotic and automated machinery

Highly automated equipment is predominant throughout the plant, which includes 40 Automated Guided Vehicule that will move production units on assembly lines following a predetermined route. Near $30M has been invested in brand new modern machinery making this factory unique in the world.

This investment of $65M demonstrates Annexair's commitment to the fight against the climate emergency. For us, it's urgent to redefine how society build things for a healthier planet and a better future for our kids.

At Annexair, we are proud to believe that we are doing our part.

CNC department

Trim and cut panel leaving CNC department

Custom made hot press for panel production

In-house weaving machine for glass fiber matt requirements

Thermo-composite assembly area

Each unit is assembled on one of our 40 Automated Guided Vehicule, following a path inside the factory

Modern style factory concept

Automated Pick & Place equipment

Ready-to-ship biocomposite unit

ANNEXAIR

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United Nations Global Compact

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12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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