PRODUCT PROFILE

INNOVUS® DECORATIVE PANELS MEDIUM DENSITY FIBREBOARDS (DP MDF)

Product profile is a compilation of all the most relevant product related information.

It is designed to be a tool to help users make informed choices when purchasing and using our products, giving information about product range, technical properties, applications, and recommendations.

Additional focus is given to product environmental performance: composition, recycling, and life cycle.

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1. SONAE ARAUCO

Sonae Arauco is one of the largest wood-based solutions players in the world. In our mission we rely on one purpose: "create wood-based solutions for a better life, a better future and a better planet."

We believe in teamwork, safe workplaces, cooperation, and long-lasting partnerships. Ethics and transparency are rooted in business integrity and commitment with our stakeholders.

Respecting the environment and the communities around us is part of our nature and at the centre of our priorities.

Sonae Arauco currently employs around 2 600 people in 9 countries (Portugal, Spain, Germany, South Africa, United Kingdom, France, Netherlands, Switzerland, and Morocco), has 23 industrial and commercial units, and sells its products in about 70 countries.

Code of Ethics

Our Code of Ethics contains a set of standards based on our shared values that govern the activities of the Sonae Arauco Group.

Sonae Arauco adheres to and actively promotes the highest ethical standards of professional conduct and strict legal compliance at all levels of the Group.

Commitment to standards of conduct must emanate from the top and is acknowledged by all Employees at all Group companies.

Furthermore, as Sonae Arauco operates across many geographic boundaries, the Company adopts principles and actions that are appropriate to specific ethical issues that can arise in those countries in which it operates.

Sustainability

Sonae Arauco's circular bioeconomy model was recognized and integrated into the *We Value Nature initiative* from World Business Council for Sustainable Development, an initiative that aims at demonstrating the importance of nature in the sustainability of the planet, leveraging its appreciation as the new normal for business in Europe.

We have Environmental Product Declarations for all our product ranges, presenting a transparent view of their environmental impact, based on the EN15804 standard.

Our products comply with the rules of the EU REACH legislation (Registration, Evaluation, Authorisation and Restriction of Chemicals) which aims to protect human health and the environment.

100% of the wood we use comes from sustainable, certified, or controlled sources and all our product ranges include FSC® (FSC® C009049) and PEFC (PEFC/14-35-00013) certified solutions.

In addition to being a natural raw material, wood has a remarkable capacity to store CO_2, making it a great alternative to materials of fossil origin. Each ton of wood results in the capture of 2 ton of CO_2 from the atmosphere.

Recycling of wood is a significant contribution to mitigate climate change, by extending wood life cycle and CO_2 retention, we create value for the environment and our business.

We set up a wood waste recycling circuit, which allows for its reintegration into the industrial process; recycled wood in Sonae Arauco represents 30 % of total wood consumption vs Wood Based Panel European industry average of 21 %.

The incorporation of recycled wood into the PB industrial process is, in some plants, above 70 %. The company has an ambitious strategy in motion to raise this incorporation of recycled wood to 85 % in some geographies, without compromising the quality of the products we put on the market.

We are working in partnership with universities and equipment suppliers to develop and implement better technologies to sort and recycle MDF, as we aim to increase the fibres use with cascade applications and lower carbon footprint of fibreboard panels.

As a renewable, reusable, and recyclable material, wood-based panels allow the decarbonization along the construction, furniture, and interior design value chain.

Sonae Arauco is also committed with Carbon Neutrality. For this purpose, it is in place a tailor made decarbonization roadmap to allow us to achieve our targets. In line with this commitment, we are starting to implement and monitor several mitigation actions to decarbonize our activity by 2040 (scope 1 and 2) and a strong effort to decarbonize our value chain (scope 3) until 2050.

ECOVADIS Sustainability Rating

ECOVADIS is a Sustainability rating system that aims at evaluating how well a company has integrated the principles of Sustainability into their business and management system. Scoring is done based on rating the answers and supporting documents provided regarding 4 evaluation pillars:

- Environment;
- Labour & Human Rights;
- Ethics;
- Sustainable procurement.

Sonae Arauco is now part of the ECOVADIS rated companies. The commitment with sustainable practices was evaluated and rated by ECOVADIS with the COMMITTED Badge.

Company Certifications

All our industrial plants that manufacture decorative panels MDF are certified according to international standards in Environmental Management (ISO 14001), Quality Management (ISO 9001), Management of Health and Safety at Work (ISO 45001) and Energy Management (ISO 50001).

These international standards are fully anchored at Sonae Arauco and guarantee that the requirements are treated in a standardised, coherent, cohesive manner and with focus on continuous improvement. Documents available for download and Sonae Arauco website: https://www.sonaearauco.com/downloads/

Plant	ISO 9001 Quality	ISO 14001 Environment	ISO 50001 Energy	ISO 45001 Health & Safety	FSC® (FSC® C009049)	PEFC (PEFC/14-35-00013)
Oliveira do Hospital	√	√	√	√	√	√
Linares	√	√	√	√	√	√
Beeskow	√	√	√	√	√	√
Nettgau	√	√	√	√	√	√

2. DECORATIVE PANELS MDF

Product Description

Innovus® Decorative Panels Medium Density Fibreboard (DP MDF) are an engineered wood product that combines medium density fibreboard— a composite wood material made from wood fibres bonded with resin—with an impregnated decorative layer of paper. The impregnated decorative paper layer is thermally fused to the medium density fibreboard under pressure, creating a durable and versatile material with a smooth and aesthetically pleasing surface.

Innovus® DP MDF are a sustainable, versatile, and cost-effective material that offers durability, aesthetic flexibility, and ease of maintenance, making it a perfect choice for a wide range of applications in both residential and commercial areas.

Product Advantages

- **Durability:** Decorative panels exhibit high durability due to the combination of the medium density fibreboard core and the decorative paper cover. Decorative panels are resistant to normal use, scratches, and wear over time.
- **Aesthetic:** Innovus® collection offers a wide range of unicolours, patterns, and textures. This versatility allows the production of furniture and decorative elements with attractive and customizable appearances, meeting various design preferences.
- **Easy Maintenance:** Decorative panels are easy to clean and maintain. Its smooth surface resists staining, and routine cleaning typically involves simple wiping with a damp cloth, making it suitable for everyday use.
- **Versatility in Applications:** Due to their structural integrity and decorative options, decorative panels are suitable for a variety of applications, including furniture construction, interior panelling, shelving, and cabinetry.
- **Ease to Process:** Innovus® DP MDF can be easily cut, shaped, and drilled during the manufacturing process, allowing for precise customization and efficient fabrication of various components.
- **Sustainability:** Decorative wood-based panels offer a range of sustainability benefits; they are durable materials that can be recycled at the end of their lifecycle. Made primarily of wood, a renewable resource, they act as carbon sinks reducing the overall carbon footprint of construction and furniture.

Product Characterization and Testing

Decorative panels are resistant to normal use, scratches, and wear over time.

At Sonae Arauco, we perform standardized tests that simulate the normal use and assess the behaviour and resistance of the decorative surface.

Innovus® Decorative Panels Medium Density Fibreboard are classified according to the criteria defined by EN 14322 - *Wood-based panels – Melamine faced boards for interior uses - Definition, requirements, and classification.* Most relevant product tests:

- **Resistance to scratching**: During use, contact with sharp objects can cause scratches on the surface. This test measures the surface's resistance to scratching using severe conditions of contact with a diamond tip on which different forces are exerted. It is expressed as a numerical rating which defines the maximum applied load which does not produce a continuous surface scratch.
- **Resistance to staining:** The test measures the decorative surface's resistance to a series of staining agents likely to be encountered in everyday use. The time and conditions of contact are specified for each staining agent. At the end of the specified contact period the test pieces are washed and examined for residual surface marks and rated.
- **Resistance to abrasion:** The test measures the ability of the decorative surface to resist to an abrasive wear. The specimen is subject to contact with cylindrical wheels covered with an abrasive paper. The number of revolutions required to cause a defined damage in the surface is used as measure of the resistance to abrasion.

Additionally, the panel mechanical characteristics are also evaluated and controlled according to EU standards. This set of characteristics, defined by the core board used, plays a key role in determining the overall performance and durability of the furniture.

By prioritizing these mechanical considerations, we enhance reliability and functionality, offering a superior product that meets both aesthetic and performance expectations.

In table below portfolio is presented by geography: with information on the product name/description, core board used and formaldehyde class.

Product Range

This document information is detailed for Decorative Panel Medium Density Fibreboard Standard (MDF ST substrate), however, Sonae Arauco Decorative solutions include a wider range of options, as described below.

SWE (South West Europe)

Purpose	Product Description	Core Board	CARB2(5)	FF
General	Innovus® DP MDF	MDF ST	√	
	Innovus® DP MDF Essence	MDF ST	√	
	Innovus® DP MDF SUPERLAC	MDF SUPERLAC	√	
	Innovus® DP MDF NOVOLAC	MDF NOVOLAC	√	
MR(1)	Innovus® DP MDF Hydro X	MDF Hydro X	√	
	Innovus® DP MDF Hydro X Essence	MDF Hydro X	√	
FR(2)	Innovus® DP MDF Fire X	MDF Fire X	√	
	Innovus® DP MDF Fire X Essence	MDF Fire X	√	
Colour(3)	Innovus® DP MDF Deep Black	MDF Colour (Deep Black)	√	
	Innovus® DP MDF Sand Grey Ecoboard	MDF Colour Ecoboard (Sand Grey)		√
Coloured FR(4)	Innovus® DP MDF Black Fire X	MDF Colour (Deep Black) Fire X		√

(1) DP MDF for use in humid conditions
(2) DP MDF with improved fire behaviour for use in dry conditions
(3) DP MDF with dyed fibres
(4) DP MDF with dyed fibres and with improved fire behaviour for use in dry conditions
(5) Core boards certified according EPA TSCA Title VI and provision of California Code of Regulation Title 17 93120, Formaldehyde Emission Standard Phase2

NEE (North East Europe)

Purpose	Product Description	Core Board	E05 CARB2(5) TSCA	FF
General	Innovus® DP MDF	MDF Basic	√	
	Innovus® DP MDF STD	MDF ST	√	√
	Innovus® DP MDF SUPERLAC	MDF SUPERLAC	√	
	Innovus® DP MDF NOVOLAC	MDF NOVOLAC	√	√
MR(1)	Innovus® DP MDF Hydro X	MDF Hydro X	√	
FR(2)	Innovus® DP MDF Fire X	MDF Fire X	√	√
Coloured(3)	Innovus® DP MDF Deep Black	MDF Coloured (Deep Black)	√	
Coloured FR(4)	Innovus® DP MDF Deep Black Fire X	MDF Coloured (Deep Black) Fire X		√

(1) DP MDF for use in humid conditions
(2) DP MDF with improved fire behaviour for use in dry conditions
(3) DP MDF with dyed fibres
(4) DP MDF with dyed and with improved fire behaviour for use in dry conditions
(5) Core boards certified according EPA TSCA Title VI and provision of California Code of Regulation Title 17 93120, Formaldehyde Emission Standard Phase2

More detailed information can be checked in product Technical Data Sheet and product Declaration of Performance, if applicable.

Product Documentation

Public documents with information on product requirements are available to download at Sonae Arauco website: https://www.sonaearauco.com/downloads/

- Product Technical Datasheet (TDS)
- Declaration of Performance (DoP)

Formaldehyde Regulations

There is a clear trend in the market, in general and for wood-based products, towards sustainability and health and safe products for the end user. This trend can also be seen, since many years and all over the globe, in the regulatory evolution of the requirements for Formaldehyde emissions in wood-based products,

European regulation limits – E1

According to European standard EN 13986[1], the products are classified regarding formaldehyde emission by class (E1 and E2). The requirement for class E1 is:

Measurement Method	Limit value
Chamber EN 717-1	≤ 0.124 mg/m^{3}h or ≤ 0.1 ppm

1. Also, in product standards EN14322.

Germany specific regulation limits – E05

According to the "*Ordinance on bans and restrictions on the marketing of hazardous substances, preparations, and products pursuant to the Chemicals Act*," known as the ChemikalienVerbotsverordnung, the limits for formaldehyde emission are defined according to the measurement method selected:

Measurement Methods	Limit value
Chamber EN 717-1	≤ 0.05 ppm
Chamber EN 16516	≤ 0.1 ppm

USA and Canada regulation limits

Regulation of CARB and TSCA Title VI defines 3 formaldehyde levels CARB2, ULEF[2] and NAF[3]. This regulation is only applicable to PB and MDF, meaning that for decorative products to be sold in USA and Canada markets the core board needs to be certified, not the surfaced product. Formaldehyde emission limits for CARB2 class are:

Level	Product	Measurement Method	Limit value
CARB2	MDF	ASTM E1333 or ASTM D6007	≤ 0.11 ppm

2. Ultra Low Emission Formaldehyde; 3. Non-Added Formaldehyde.

Sonae Arauco's factories have implemented internal inspections and control plans and supervision and certification agreements with external entities. Self-declarations and certificates are available on request.

Plant	E1 Self - declaration	E05 Self - declaration	E05 Certificate	CARB Certificate
Oliveira do Hospital	√	√		√
Linares	√	√		√
Beeskow	√		√	√
Nettgau	√		√	√

3. Decorative Panels MDF – Raw Materials

In this section the most important pieces of information and documents related to the raw materials used to produce Innovus® DP MDF are included.

A global description of product composition is disclosed below, and it is also available in product EPD (Environmental Product Declaration). As Sonae Arauco EPD represents 100% of the Decorative Panels Medium Density Fibreboard production, all information showed is referring to average values, combining data of one year of production of each of the Sonae Arauco plants.

Detailed composition for specific products purchased from one of several of Sonae Arauco plants, can be made available upon request.

Main constituent materials (% by mass):

- Wood chips: approx. 80 %
- Water: 4 – 11 %
- Resin*: 9 – 25 %
- Decorative surface layer: 0.5 – 4 %
  - 40 – 60 % decorative paper
  - 60 – 40 % melamine formaldehyde resin**

* Formaldehyde based resin: UF - urea formaldehyde resin or MUF - melamine-urea-formaldehyde resin.

** during the pressing process the resin is fully reacted, and the decorative paper is "bonded" with the core medium density fibreboard panel.

Renewable content

Product	Renewable content	Fossil-based content
Innovus® DP MDF	79 to 83 %	17 to 21 %

Wood

Wood from largely regional forests is used for manufacturing medium density fibreboard used in the production of Innovus® Decorative Panels Medium Density Fibreboard. This wood is typically procured with an average radius of 250 km of the plants' locations.

We comply and act according to EUTR and are engaged in implementing EUDR.

On December 30, 2025, the EUDR regulation will take effect, superseding the EUTR legislation that is now in place. It expands on the current EUTR regulation on wood legality due diligence system requirements for wood-made products. It will represent additional challenges to ensure compliance, mainly in the form of stricter guidelines requiring the consideration of enhanced traceability across the supply chain, among other requisites. We are preparing for timely implementation and are committed to continue enhancing the sustainability in our business.

Wood mix (average of all plants in 2024)

Product	Roundwood	By products	Pre-consumer recycled wood	Post-consumer recycled wood
Innovus® DP MDF	86 %	14 %	0 %	0 %

The entire Innovus® DP MDF range can be made available on request as FSC® (FSC® C009049) or PEFC (PEFC/14-35-00013) (program for the endorsement of forest certification) certified products.

For more detailed information, in addition to FSC® and PEFC certificates, also self-declarations are available on request, detailing our wood mix, wood sources and incorporation of recycled wood, by plant and/or geographic location:

Plant	Wood Sources	Sustainable Sources	Recycled Wood Content	Wood Preservatives	FSC® (FSC® C009049)	PEFC (PEFC/14-35-00013)
Oliveira do Hospital	√	√	√	√	√	√
Linares	√	√	√	√	√	√
Beeskow	√	√	√	√	√	√
Nettgau	√	√	√	√	√	√

Chemicals

In our manufacturing process, we integrate various chemicals to enhance efficiency and product features. However, our approach is guided by stringent criteria rooted in compliance with environmental, health, and safety legislation. We prioritize the selection of chemicals that not only contribute to the efficacy of our manufacturing operations but also align with responsible and sustainable practices. By adhering to these strict criteria, we ensure that our processes meet the highest standards of environmental protection and health and safety, underscoring our commitment to responsible manufacturing practices.

And as a result, our product does not contain:

- Substances listed in the ECHA candidate list (most updated list is considered) exceeding 0.1 percentage by mass.
- Other substances carcinogenic, mutagenic or reprotoxic (CMR) in categories 1A or 1B, which are not on the ECHA candidate list, exceeding 0.1 percentage by mass.
- Biocide products added in the production or raw materials treated with biocide products (treated product as defined by the EU Ordinance on Biocide Products No. 528/2012)

Product self-declarations available (on request):

- Reach declaration
- Contaminants and Prop 65
- Asbestos
- Wood preservatives

Decorative Paper

Decorative paper is a technically advanced product that provides an excellent surface for decorative printing and resin saturation for use in the production of decorative panels. Decorative papers can be dived in 2 main categories: unicolour and printed decors.

Unicolour decors: Divided in White and Solid colours.

Printed decors: Reproduce natural materials with high level of authenticity. There are developments based on wood, stones, cement, textiles, metal, and other materials, with the high printing quality, that can offer inspiration for decoration and furniture projects.

Our decorative paper suppliers are based in Europe and certified by Responsible Forestry Practices.

4. Decorative Panels MDF – Processing

To support users and ensure the optimal performance and aesthetic appeal of the decorative wood-based panels, a set of comprehensive guidelines for the storage and processing of decorative wood-based panels as well as basic safety and environmental recommendations are collected.

Storage recommendations

The storage conditions for wood-based panels should be close to 20 ºC and 35 – 50 % relative humidity. It is important to prevent sudden and wide changes in these conditions, which can affect the quality of the panels.

For the correct transportation and storage of wood-based panels, it is recommended to:

- Adequately protect the boards from the weather during transport.
- Store the boards in a covered area, protected from the weather and away from sources of humidity and intense heat.
- Ensure the floor is level and there are no objects causing unevenness in the storage area, store them horizontally, elevated off the ground using dry supports, at a height that allows forklift forks to enter without damaging the material.
- Store the boards grouped by size, so that they are aligned, and no board protrudes more than 15mm.
- When using support wedges or beams, ensure that:
    - the beams are of the same height.
    - a spacing between beams of 600 mm or less,
    - the beams are vertically aligned between pallets and placed parallel to the smallest dimension of the panels.
- Repack the boards whenever their packaging is damaged.
- Stock management is also recommended to minimize the time the material remains in storage, complying with the FIFO rule whenever possible.

Processing recommendations

Cutting

- Utilize carbide and diamond-tipped saw blades for improved longevity and reduced chipping.
- Adjust cutting speed and feed rates based on panel thickness to prevent overheating.
- Support the panels adequately during cutting to minimize vibrations and ensure accuracy.

Drilling

- Select high-quality, carbide and diamond-tipped drill bits designed for wood-based panels.
- Use a backer board to minimize chip-out on the exit side of the panel.
- Apply consistent pressure and use a slow drilling speed to avoid overheating.
- Clear debris regularly to prevent clogging and maintain drilling efficiency.

Routing and Edge Banding

- Use carbide and diamond-tipped router bits for clean and precise edges.
- Employ edge banding with compatible adhesives for durable edge finishes.
- Ensure proper adhesive application and edge alignment.

Cleaning recommendations

With their resistant, hygienic, and non-porous surface, Innovus® DP MDF require no special care when it comes to maintenance and cleaning.

It is recommend cleaning the surfaces with a soft, non-abrasive cloths or sponges (dry or damp). After cleaning the surface must be dried, is not recommended to leave the surface wet.

Suitable products to be used are commercially available surfactant detergents that do not contain abrasive components, such as liquid cleaners and soaps.

Can also be used organic solvents such as alcohol or acetone (varnish remover) to remove specific stains. In the case of using volatile substances, a good ventilation of the room afterwards must be ensured.

The use of furniture cleaners and waxes is not recommended, as these products tend to get into the surfaces and create a "dirt" layer. The use of steam cleaning, degreasing agents, strong acids or bleaches is also not recommended.

Safety recommendations

Sonae Arauco decorative products are a wood product composed of wood and cured resin. Only when the product is altered downstream by cutting, sawing, sanding, heating or other means and significant dust is generated it becomes a hazard - in its shipped and finished form, this product is not considered hazardous.

Precautions for Safe Handling

Accumulation and dispersion of dust with an ignition source can cause a combustible dust explosion. Keep dust levels to a minimum and follow applicable regulations.

Avoid creating or spreading dust. Keep away from heat, sparks, open flames, and hot surfaces. No smoking.

Avoid contact with skin, eyes, and clothing. Do not breathe dust. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and when leaving work.

Prioritize safety during panel processing by adhering to these key measures:

- Wear appropriate personal protective equipment (PPE).
- Ensure all machinery is in proper working condition and follow safety protocols.
- Provide adequate ventilation when working with adhesives and finishes.

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product itself is not explosive but if dust is generated, dust clouds suspended in air can be explosive.

Since the panels are mostly made of wood, the formation of wood dust is to be expected during production process. Regarding the dust extraction and fire protection, local safety regulations must be controlled during Innovus® Panels processing (cutting, drilling, edging, etc.). Protective equipment as safety glasses, dust mask, gloves are recommended when using hand tools without a dust extraction system.

The ignition temperature of wood-based panels is approx. 400 °C. Suitable extinguishing media is water and foam.

In case of fires, the same firefighting techniques can be used as for other wood-like building materials. Due to the high proportion of wood, the composition of the flue gases is comparable to that of wood. Incomplete combustion, as with any other organic material, may contain toxic substances in the smoke.

End of Life

The principle of cascade use of the wood must be applied to the elements made with Innovus® DP MDF. Sonae Arauco coated MDF leftovers and residual materials should be primarily directed towards material recycling. If this is not possible, they must be directed for energy recovery instead of landfilling.

Waste code according to the European List of Waste: 17 02 01

Reuse: In the case of a building refurbishing, Innovus® DP MDF can be separated, if the panel was not bonded over its full surface and used again for the same or similar application.

Recycle: Waste from deconstruction, decoration and furniture elements can be separated and routed to a material stream (post-consumer recycled material). The waste wood resulted can be recycled in the production of new MDF or other types of wood-based boards.

Energetic use: If recycling is not an option, the product can be separated to be used to energetic recovery. Due to the high heating value of approx. 16.6 MJ/kg at 20 % moisture content, Innovus® Decorative Panels Medium Density Fibreboard can be used for energy recovery and the generation of heat and electricity (e.g., in CHP plants), following the cascading principle for wood. Please observe all legal requirements that can be applied locally.

Packaging disposal information

Main directive for packaging is Directive 94/62/EG, which entered into force in 1994, and the amendments made in Directive (EU) 2018/852.

The essential requirements, part of Directive 94/62/EG, are still in effect after the amendments made in Directive (EU) 2018/852 and focus on having packaging materials more sustainable.

Aligned with this goal and to stimulate recycling, reuse, and other useful applications for packaging waste, below are informed the codes that are applicable to the materials possible to be used in the packaging of Sonae Arauco decorative panels DP MDF:

Description	Material	Abbreviation	Numeration	% by unit weight*
Protection board (top and bottom)	MDF / PB /OSB	FOR	50	2 to 4
Skids	MDF /PB	FOR	50	1 to 2
Protection corners	Cardboard	PAP	21	< 1
Plastic straps	Plastic	PET	1	
Plastic film (Wrapping or shrinking)	Plastic	LDPE	4	
Protection cardboard	Corrugated cardboard	PAP	20	
Label	Paper	PAP	22	
Packaging/Product ratio				NEE: 4/95 SWE: 6/94

*Information for standard packaging and reference product 16mm DP MDF, specific information for other cases, available on request

5. Decorative Panels MDF – Life Cycle and Carbon Footprint

The global growth in the awareness and value given to sustainability, as an instrument to improve the quality of our lives in the present and protect our ecosystems for the future, matches Sonae Arauco mission and values in full as we are committed to the concept of sustainable use of raw materials and actively respect this principle in all business practices.

The increased relevance given worldwide to sustainability, circularity and environmental impacts of products, companies and individuals has however created a broad and not always simple to understand, range of options for Ecolabeling and sustainability certification systems.

Although across the previous sections, several documents and pieces of information presented are also related to Sustainability, Indoor Air quality and Health and Safety, in this section is presented a summary of the Ecolabels and Certification systems options more commonly associated to Wood Based products and applications, giving a short description of the label/system, and how Sonae Arauco products score or can contribute for our customers certification processes.

Environmental life cycle assessment

Sonae Arauco developed an Environmental life cycle assessment for all products, covering data from all sites in Europe and South Africa, according to the guidelines of ISO 15804+A2.

Innovus® Decorative Panels Medium Density Fibreboard have an independent verified environmental product declaration (EPD) according to ISO 14025. See EPD MDF coated on: https://www.sonaearauco.com/downloads/

Stored Carbon dioxide and Biogenic Carbon Content:

Innovus® Decorative Panels Medium Density Fibreboard	kg/m²
Biogenic Carbon Content (kg C)	6.42
Stored Carbon Dioxide (kg CO_2 equivalent)	19.5

Biogenic carbon refers to carbon that is part of the natural carbon cycle, specifically originating from living organisms and organic matter. This carbon is derived from plants through the process of photosynthesis, where plants absorb carbon dioxide from the atmosphere and convert it into organic compounds.

Biogenic carbon is considered a more sustainable and environmentally friendly source because it does not contribute to the net increase of carbon dioxide in the atmosphere over geological timescales. It plays a role in promoting a circular carbon economy, where carbon is continually recycled through natural processes.

Global Warming Potential:

Parameter (Module A1-A3) *	Unit – kg CO_2 equivalent
Global warming Potential – total	-4.73
Global warming Potential – fossil	11.9
Global warming Potential - biogenic	-16.7
Global warming Potential – luluc	0.0295

*Declared unit:1 m² Innovus® DP MDF

For the global warming potential (GWP) during the production phase (Module A1-A3) of the DP MDF, the total calculated value is a negative value. This is due to the contribution of wood; while trees are growing, the wood stores carbon dioxide as biogenic carbon and does therefore not have a greenhouse effect as long as it is stored in the product.

Only if/when the product is used for energy generation at the end of the product life cycle (Module C3) does the stored carbon leaves the product.

Product Indoor Air Quality

Eurofins Indoor air Comfort

This tool allows to evaluate product compliance according to several indoor air quality requirements, established for specific countries and /or regions.

It is available the Eurofins attestation for Innovus® Decorative Panels Medium Density Fibreboard, and test report can be shared on request.

6. CONTRIBUTIONS TO BUILDING CERTIFICATION SCHEMES

Information bellow is detailed for Decorative Panel Medium Density Fibreboard Standard (MDF ST substrate),

BREEAM

Building Research Establishment Environmental Assessment Method (BREEAM) is an internationally recognized method for assessing and certifying the sustainability of buildings. BREEAM assesses the performance of individual buildings to increase their value and attractiveness while improving living conditions for their users.

The main building categories BREEAM can be applied to are Communities, Residential, New Construction and Buildings in Use. This certification comprises a scoring system whereby buildings are rated according to their compliance with the requirements established by the organization (BRE). There are distinct categories that tackle different issues involved in the construction of buildings, such as energy, water, or the health and well-being of the people who live in the building.

Compliance: BREEAM is a system aimed at certifying buildings and not materials, thus Sonae Arauco can contribute to this certification by obtaining credits that result from using our wood solutions.

Innovus® Decorative Panels Medium Density Fibreboard are compliant with the prerequisites for the use in BREEAM certified buildings and fulfils the emission requirements. Beyond that the usage of Innovus® Decorative Panels Medium Density Fibreboard contributes to gathering additional points within the BREEAM scoring system. The following table shows all BREEAM credits which are applicable to the usage of our product. As the achievable number of points depends on the attributes of all used materials in the BREEAM building project and further actions by the constructor, we cannot guarantee to obtain the maximum score.

Contribution of product Innovus® DP MDF to BREEAM credits:

Chapter	Requirement Summary	Maximum Credit Points	Product contributions
MAT 01. Life Cycle Impacts	Environmental Product Declaration (EPD) can be used in Credit "MAT 01: Life cycle impacts" for the calculation of the Life-Cycle Assessment of the building. If product specified at Design Stage and installed by Post-Construction Stage is covered by verified EPD, you can achieve one credit.	1 Point	This product has an independent verified Environmental Product Declaration (EPD) according to ISO 14025. Numerous indicators of environmental impacts, waste generation and water and energy consumption are available. See EPD MDF coated on: https://www.sonaearauco.com/downloads/
MAT 03. Responsible Sourcing of Construction Products	Prerequisite: It must be demonstrated that all timber used in the project is "legally harvested and traded timber."	Prerequisite	Sonae Arauco holds the chain of custody certification PEFC (PEFC/14-35-00013) and FSC® (FSC® C009049), covering all industrial operations. Use delivery receipt as evidence document. More information is available for download at: https://sonaearauco.com/sustainability/other-certifications/
H&W 02. Indoor Air Quality	Avoidance of asbestos	Prerequisite	All products produced at Sonae Arauco plants are in line with European directives regarding presence of Hazardous substances and are not constituted of any Asbestos within. (Self-declaration on non-use of Asbestos is available on request)
H&W 02. Indoor Air Quality	Minimizing sources of pollution - Emissions from building products. Product should meet the exemplary level emission criteria: Formaldehyde ≤ 0.06 mg/m^3 and TVOC ≤ 1.0 mg/m^3 Category 1A and 1B carcinogens ≤ 0.001 mg/m^3	2 Points	Sonae Arauco coated MDF meet the requirement for Volatile Organic Compounds - product and post-construction (2 points), as they do not exceed the maximum permitted emissions. Product test report on requirement.

WELL building standard

The WELL Building Standard is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing, through air, water, nourishment, light, fitness, comfort, and mind. The WELL is a third-party building certification scheme managed and administered by the International WELL Building Institute (IWBI) in collaboration with Green Building Certification Institute (GBCI).

Preconditions: Preconditions (like LEED prerequisites) represent the core features of the WELL Building Standard. To be awarded WELL certification, all applicable Preconditions must be met by the proposed building.

Optimizations: Optimizations provide project teams with optional pathways to meet WELL certification requirements. These optimization features (like LEED credits) include technologies, design strategies, protocols and policies that can be implemented by the owners, designers, engineers, contractors, users, and operators. To each WELL optimization is assigned several points according to its potential impact in addressing a specific health and wellness concern or opportunity for health promotion.

Compliance: WELL BUILDING STANDARD is a system aimed at certifying buildings and not materials, thus Sonae Arauco can contribute to this certification by obtaining points that result from our wood solutions.

Innovus® Decorative Panels Medium Density Fibreboard are compliant with the prerequisites for the use in WELL BUILDING STANDARD v2™ certified buildings. Beyond that, the usage of a Innovus® Decorative Panels Medium Density Fibreboard contributes to gathering additional points within the WELL features which are applicable to the usage of our product. The following table shows all WELL features which are applicable to the usage of our product. As the achievable number of points depends on the attributes of all used materials in the WELL building project and further actions by the constructor, we cannot guarantee to obtain the maximum score.

Contribution of product Innovus® DP MDF to WEEL building standard v2^{tm} points:

Chapter	Requirement Summary	Maximum Points	Product Contributions
X01 Material Restrictions	To reduce or eliminate human exposure to hazardous building materials, this feature requires the restriction of widely known hazardous ingredients, namely asbestos, mercury and lead, in newly installed building materials or applied products.	Precondition	All products produced at Sonae Arauco plants are in line with European directives regarding presence of Hazardous substances and are not constituted of any Asbestos within. REACH Declaration Available for download at: https://www.sonaearauco.com/downloads/ Sonae Arauco also performs regular tests in external laboratories to guarantee that heavy metals and substances like Lead, Mercury, Phthalates, Chromium (III) and Chromium (VI), cadmium, among others, are in compliance with defined requirements and regulations.
X05 Enhanced Material Restrictions	**Parts 2a,2c. Select Compliant Architectural and Interior Products:** At least 50 % by cost of newly installed products under the classes listed below, as defined by Appendix X1 (minimum 10 distinct products), meet the following requirements, unless higher amounts are mandated by local code: Flooring products, ceiling and wall finishes, and demountable wall partitions contain halogenated flame retardants at less than 100 ppm (0.01 %) by weight	1 Point	The product complies with this requirement. No halogenated flame retardants are used.
X05 Enhanced Material Restrictions	**Parts 2a,2c. Select Compliant Architectural and Interior Products:** At least 50 % by cost of newly installed products under the classes listed below, as defined by Appendix X1 (minimum 10 distinct products), meet the following requirements, unless higher amounts are mandated by local code: Flooring products, ceiling and wall finishes, and demountable wall partitions contain orthophtalates at less than 100 ppm (0.01 %) by weight		The product complies with this requirement. No phthalates are used in this product. (Self-declaration on non-use of phthalates available)
X06 Volatile Organic Compounds (VOC) Restrictions	**Part 2a. Restrict VOC Emissions from Furniture, Architectural And Interior Products:** Products: Furniture and wall panels tested per methods and VOC emission thresholds established in one of the following: 1) AgBB 2) European Union LCI VOC thresholds10 following EN 16516-1:2017 testing methods 3) ANSI/BIFMA e3-2014, sections 7.6.1 or 7.6.2 (Furniture) 4) Any compliance path accepted to meet the VOC emission requirements of the 'Low-Emitting Materials' credit of the LEED v4.1 standard	2 Points	Compliant with ABG/AgBB (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (June 2021). (Eurofins attestation available on request)
X06 Volatile Organic Compounds (VOC) Restrictions	**Part 2c. Restrict VOC Emissions from Furniture, Architectural and Interior Products:** All composite wood panels, including medium-density fibreboard, plywood and particle wood panels meet the 'Formaldehyde emissions evaluation' criterium of the 'Low-Emitting Materials' credit of the LEED v4.1 standard, or meet one of the following: US EPA TSCA Title VI, Europe E1, Japan Four-star.		Product is evaluated per EN-717-1:2014 for formaldehyde emissions and complies with emissions class E05, in accordance with the German Chemicals Prohibition Ordinance (ChemVerbotsV) and based on DIBt Guideline 100. (Certificate or self-declaration available on request)

DGNB

DGNB (German Sustainable Building Council) consistently considers the entire life cycle of a project and evaluates the overall performance instead of individual measures. The DGNB is based on the three central sustainability areas of ecology, economy, and socio-cultural quality, which are equally weighted in the assessment. In a holistic approach, the DGNB System also evaluates the location and technical and process-related quality. The performance of these qualities can be assessed through certification criteria. These are individually adapted to different schemes and can be applied to new buildings, existing buildings, renovations, and buildings in use. To meet the requirements of the different phases of the life cycle, DGNB certification can be applied to new and existing buildings, for renovation, for interior design, for building operation, for deconstruction and construction sites.

Compliance: DGNB is a system aimed at certifying buildings and not materials, thus Sonae Arauco can contribute to this certification by obtaining credits that result from our wood solutions. Indeed, Sonae Arauco products could be included in the "DGNB Navigator" platform and register for "DGNB Navigator Label."

A construction product listed in the DGNB Navigator can also receive the **DGNB Navigator Label** if a product-specific Environmental Product Declaration (EPD) is available and if all product characteristics according to the DGNB criteria are filled in, including the determination of all quality levels following a data comparison by the DGNB.

Which quality levels Innovus® Decorative Panels Medium Density Fibreboard fulfil according to the DGNB system and where you can find the required verifications can be found in the following table. The contributions to the overall degree of fulfilment resulting from this according to the DGNB point system depend, among other topics, on the relevance of the product group for the overall building. Please note that other criteria are also relevant for the overall rating of the building. Therefore, we cannot guarantee a score to be obtained by Innovus® Decorative Products.

Contribution of product Innovus® DP MDF products to DGNB quality level:

Chapter	Requirement Summary	Quality Level	Product contributions
TEC 1.6 Ease of recovery and recycling	**Recycling and disposal path**: **Material recovery in building construction** - With currently available technology, the material of the building component/ building sub-component/construction product can predominantly be recovered, enabling it to be used for production of a new building component/ building sub-component/construction product for building construction. or **Material recovery** - With currently available technology, the building component/ building sub-component/construction product can predominantly be used as a secondary raw material for use outside of building construction.	2	Sonae Arauco coated MDF can be collected separately and used in MDF manufacture and other types of wood-based boards. The product is recyclable at the end of its useful life. See more information in EPD MDF coated - download available at: https://www.sonaearauco.com/downloads/
TEC 1.6 Ease of recovery and recycling	Declaration by the/a manufacturer or a disposal company, or plausible statement by the auditor specifying a reliable external source (e.g., EPD) indicating that material recovery is normal for the building component/building sub-component/product and can be carried out with currently available technology.	General Requirement - documentation for QL2	This product has an independent verified Environmental Product Declaration (EPD) and data according to ISO 14025. See EPD MDF coated on: https://www.sonaearauco.com/downloads/
TEC 1.6 Ease of recovery and recycling	No chemical wood preservatives in the interior	4	During Sonae Arauco coated MDF production, no wood preservatives are added. (Self-Declaration on non-use of wood preservatives is available)
ENV 1.2 Local environmental impact	Construction products equipped with biocides and flame retardants: Wood preservatives, wood materials, insulating materials (Factory and building site): Boron compounds ≤ 0.1 %	4	The product complies with this requirement. No halogenated flame retardants are used.
ENV 1.2 Local environmental impact	Exterior and Interior walls, floor, and ceiling coverings (such as fibreboards): Asbestos free	4	All products produced at Sonae Arauco plants are in line with European directives regarding presence of Hazardous substances and are not constituted of any Asbestos within. (Self-Declaration on non-use of Asbestos is Available)
ENV 1.2 Local environmental impact	Documentation of emission: Certification (no more than 5 years old) by a laboratory accredited in accordance with ISO 17025 that the product or system complies with the AgBB criteria (except for sensory characteristics) based on emissions testing in accordance with ISO 16000-9, prEN 16516 or EN 16402	4	Product complies with the LCI values of the German AGB/AgBB (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (June 2021). (Eurofins attestation is available)
ENV 1.3 Sustainable resource extraction	Certified sustainable resource extraction	1.3	Sonae Arauco holds the chain of custody certification PEFC (PEFC/14-35-00013) and FSC® (FSC® C009049) covering all industrial operations. Use delivery receipt as evidence document. More information is available for download at: https://sonaearauco.com/sustainability/other-certifications/

LEED

Sonae Arauco has been investing in the development of construction and decorative solutions which, while adapting to the most varied technical requirements, play a key role in helping projects to obtain LEED® (Leadership in Energy and Environment Design) certification.

Developed by the US Green Building Council (USGBC), LEED® is one of the most recognized building performance management systems in the world which assesses performance in terms of sustainability using a comprehensive set of tools.

Compliance: LEED® is a system aimed at certifying buildings and not materials, thus Sonae Arauco is able to contribute to this certification by obtaining credits that result from the use of our wood solutions.

Innovus® Decorative Panels Medium Density Fibreboard is compliant with the prerequisites for the use in LEED certified buildings outside the U.S. Beyond that the usage of a Innovus® Decorative Panels Medium Density Fibreboard contributes to gather additional points within the LEED scoring system. The following table shows all LEED credits which are applicable to the usage of our product. As the achievable number of points depends on the attributes of all used materials in the LEED building project and further actions by the constructor, we cannot guarantee to obtain the maximum score.

In the following link (https://www.sonaearauco.com/downloads/) – "Information for Certification LEED" – it is possible to see the document which explains the LEED program and how SA wood-based products can help to obtain LEED Credits.

Contribution of product Innovus® DP MDF to LEED credits:

Chapter	Requirement Summary	Maximum Credit Points	Product contributions
Material and Resources	**Construction and Demolition Waste Management Planning** The intention with this prerequisite is to reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.	1 Point	Sonae Arauco coated MDF can be collected separately and used in MDF manufacture and other types of wood-based boards. The product is recyclable at the end of its useful life. See more information in EPD MDF coated - download available at: https://www.sonaearauco.com/downloads/
	Building Product Disclosure and Optimization - Environmental Product Declarations Option 1. Environmental Product Declaration	1 Point	This product has an independent verified Environmental Product Declaration (EPD) and data according to ISO 14025. See EPD MDF coated on: https://www.sonaearauco.com/downloads/
	Building Product Disclosure and Optimization - Sourcing of Raw Materials Option 2.3: Wood products must be certified by the Forest Stewardship Council® (FSC®) or USGBC-approved equivalent.	1 Point	Sonae Arauco holds the chain of custody certification PEFC (PEFC/14-35-00013) and FSC® (FSC® C009049) covering all industrial operations. Use delivery receipt as evidence document. More information is available for download at: https://sonaearauco.com/sustainability/other-certifications/
	Building Product Disclosure and Optimization - Material Ingredients Option 2: Material Ingredient Optimization	1 Point	Sonae Arauco products are not produced with added ingredients listed in ECHA candidate list (most updated list is considered) exceeding 0.1 percentage by mass or other substances carcinogenic, mutagenic or reprotoxic (CMR) in categories 1A or 1B, which are not on the ECHA candidate list, exceeding 0.1 percentage by mass. Declaration available at: https://www.sonaearauco.com/downloads/
	Building Product Disclosure and Optimization - Sourcing of Raw Materials Regional Materials: Building materials or products that have been sourced (extracted, manufactured, and purchased) within one hundred miles (160 km) of the project site are valued	Positive contribution	Information Available on request. See also chapter "Decorative Panels MDF- Raw Materials" of this document.
Indoor Environmental Quality	Low-emitting Materials- VOC emissions evaluation	3 Points	Compliant with ABG/AgBB (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (June 2021). (Eurofins attestation available)
	Low-emitting Materials- Formaldehyde emissions evaluation		Product is evaluated per EN-717-1:2014 for formaldehyde emissions and complies with emissions class E05, in accordance with the German Chemicals Prohibition Ordinance (ChemVerbotsV) and based on DIBt Guideline 100. (E05 Certificates or Self-Declarations available)

7. LISTING IN PRODUCTS PLATFORMS

Efforts to implement sustainability policies, guidelines and actions are a concern of Sonae Arauco that is shared broadly by the market.

To support this effort, Sonae Arauco is joining different platforms that target the listing and/or scoring of products with focus in sustainability and allow users to have their owns assessments made easier taking advantage of the information provided to the platform by Sonae Arauco.

Nordic Ecolabelling Supply Chain Declaration Portal

The portal allows suppliers to declare products in order to support their customers to obtain the Nordic Swan Ecolabel. In the listing process it is declared the properties of the products, such as raw materials used, as for example resins, wood species and other components and also performance in what regards indoor air quality impact, such as formaldehyde emissions level.

With this product listing by Sonae Arauco, when certifying a final product according to Nordic Ecolabeling, customers will be able to automatically select Innovus® Decorative Panels Medium Density Fibreboard from the drop-down list available in the platform.

DGNB Navigator

DGNB Navigator is a platform with the focus in supporting the DGNB certification system (as described above in section "Contribution to Building Certification Schemes".

This platform was created in in Germany and is gaining relevance in other markets/geographies for construction application. In this platform architects, house planners and DGNB auditors can find all relevant product data.

The listing in DGNB is made product by product, meaning that the supplier selects which products to list. After registering to have the products listed, suppliers provide all required product information for the products to be listed, all data is checked for the completeness and plausibility by the DGNB and made available for customers to use in their DGNB certification processes.