

Agrona

**Wood without cutting
a single tree**

**The best sustainable composite technology
recognized by JEC World Composite, Paris 2023**



COMPANY SUMMARY

Agrona transforms agricultural residues into sustainable wood panels, reducing open-field burning, carbon emissions, and smog. Our patent-pending technology produces high-quality, low-cost particleboard, overcoming challenges faced by local manufacturers, including raw material seasonality, high energy use, and inconsistent board quality.

By creating value from unutilized agro-waste, Agrona supports rural farmers with new income streams and provides decent jobs for youth and women, particularly in underserved communities. With over six years of R&D, our solution addresses urgent environmental and social challenges while enabling scalable production for furniture, construction, and industrial applications, contributing to a circular economy and climate-resilient development.



VALUE PROPOSITION

a) Challenge we solve

Furniture and construction industries rely on wood panels made with carcinogenic resins and sourced from deforestation, harming health, forests, and the climate. In MENA, reliance on imports creates long delays and high costs, limiting access to sustainable materials.

b) Customers who are facing this problem

Our solution serves wholesalers, furniture makers, and construction companies across MENA, where the wood panel market is ~\$4.5B annually. Agrona offers a low-carbon, safe, and locally produced alternative that reduces environmental harm while ensuring faster, affordable supply.

a) Solution

Agrona produces durable, low-carbon wood panels from agricultural residues and 100% bio-based resins—without cutting a single tree. Our panels cost up to 50% less than imported alternatives and are delivered with short lead times.

This solution protects forests, provides eco-friendly panels that meet global environmental standards, and eliminates exposure to carcinogenic resins, safeguarding health. Agrona holds two patent-pending technologies, ensuring innovation and scalability while creating measurable environmental and social impact.



Product certification



Patent

SOCIAL & ENVIRONMENTAL IMPACT

Agrona transforms agricultural waste into sustainable wood panels, linking business growth with environmental and social impact. Per ton of agri-waste, we:

1. Produce 1 m³ of panels, enough for 20 school furniture units in rural areas
2. Save 3 trees from deforestation
3. Avoid 27 tons of CO₂ emissions
4. Create 6 decent rural jobs/day

Our work directly advances 3 main SDGs

SDGs #12 (Responsible Consumption)

SDG#13 (Climate Action), #15 (Life on Land), and

SDG #8 (Decent Work & Economic Growth), delivering scalable, measurable benefits for communities and the planet.

Every ton of agri-residue equals








Three saved trees



27 tons of CO₂ captured



6 decent Jobs/day



20 furniture units produced

COMPETITIVE ADVANTAGE

Agrona produces wood panels from agricultural residues, offering a 30–50% cost advantage over imported alternatives. Unlike conventional panels, which rely on tree-based materials and carcinogenic chemicals, our panels are fully natural, eco-friendly, and safe. This unique combination of affordability, sustainability, and health benefits positions Agrona as a scalable, socially and environmentally responsible alternative in the MENA and global markets.

Agrona Baseboards



General use applications used in dry conditions (Type Agro- Panels 1)

Property	Test method	Unit	Requirement							
			Thickness range (mm, nominal)							
			< 3	3 to 6	> 6 to 13	> 13 to 20	> 20 to 25	>25 to 32	> 32 to 40	> 40
Bending strength	EN 310	N/mm ²	11,5	11,5	10,5	10	10	8,5	7	5,5
Internal bond	EN 319	N/mm ²	0,31	0,31	0,28	0,24	0,20	0,17	0,14	0,14

NOTE The values are characterised by a moisture content in the material corresponding to a relative humidity of 65 % and a temperature of 20 °C.

Boards for interior fitments (including furniture) for use in dry conditions (Type Agro-Panels 2)

Property	Test method	Unit	Requirement								
			Thickness range (mm, nominal)								
			< 3	3 to 4	> 4 to 6	> 6 to 13	> 13 to 20	> 20 to 25	> 25 to 32	> 32 to 40	> 40
Bending strength	EN 310	N/mm ²	13	13	12	11	11	10,5	9,5	8,5	7
Modulus of elasticity in bending	EN 310	N/mm ²	1 800	1 800	1 950	1 800	1 600	1 500	1 350	1 200	1 050
Internal bond	EN 319	N/mm ²	0,45	0,45	0,45	0,40	0,35	0,30	0,25	0,20	0,20
Surface soundness	EN 311	N/mm ²	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8

NOTE The values are characterised by a moisture content in the material corresponding to a relative humidity of 65 % and a temperature of 20 °C.

Boards for Non-load-bearing boards for use in humid conditions (Type Agro-Panels 3)

Property	Unit	Requirement							
		Thickness range (mm, nominal)							
		< 3	3 to 4	> 4 to 6	> 6 to 13	> 13 to 20	> 20 to 25	> 20 to 25 32	> 40
Bending strength	EN 310	13	13	14	15	14	12	9	7,5
Modulus of elasticity in bending	EN 310	1 800	1 800	1 950	2 050	1 950	1 850	1 550	1 350
Internal bond	EN 319	0,50	0,500	0,500	0,45	0,45	0,40	0,35	0,25
	EN 319	0,50	0,50	0,50	0,45	0,40	0,35	0,30	0,25
Swelling in thickness, 24 h	EN 317	25	25	20	17	14	13	13	12
	%								

NOTE The values for bending properties, internal bond and swelling in thickness are characterised by a moisture content in the material (before treatment in the case of swelling in thickness) corresponding to a relative humidity of 65 % and a temperature of 20 °C.

Boards for load-bearing applications used in dry interior conditions (Type Agro-Panels 4)

Property	Test method	Unit	Requirement							
			Thickness range (mm, nominal)							
			3 to 4	> 4 to 6	> 6 to 13	> 13 to 20	> 20 to 25	> 25 to 32	> 32 to 40	> 40
Bending strength	EN 310	N/mm ²	15	16	16	15	13	11	9	7
Modulus of elasticity in bending	EN 310	N/mm ²	1 950	2 200	2 300	2 300	2 050	1 850	1 500	1 200
Internal bond	EN 319	N/mm ²	0,45	0,45	0,40	0,35	0,30	0,25	0,20	0,20
Swelling in thickness, 24 h	EN 317	%	23	19	16	15	15	15	14	14

If it is made known by the purchaser that the boards are intended for specific use in flooring, walls or roofing the performance standard EN 12871 also has to be consulted. This might result in additional requirements having to be complied with.

NOTE The values for bending properties, internal bond and swelling in thickness are characterised by a moisture content in the material (before treatment in the case of swelling in thickness) corresponding to a relative humidity of 65 % and a temperature of 20 °C.

Boards for load-bearing applications used in humid conditions (Type Agro-Panels 5)

Property	Test method	Unit	Requirement							
			Thickness range (mm, nominal)							
			3 to 4	> 4 to 6	> 6 to 13	> 13 to 20	> 20 to 25	> 25 to 32	> 32 to 40	> 40
OPTION 1										
Internal bond after cyclic test	EN 321	N/mm ²	0,30	0,30	0,25	0,22	0,20	0,17	0,15	0,12
Swelling in thickness after cyclic test	EN 321	%	12	12	12	12	11	10	9	9
OPTION 2										
Internal bond after boil test	EN 1087-1	N/mm ²	0,15	0,15	0,15	0,14	0,12	0,11	0,10	0,09

NOTE The values for internal bond and swelling in thickness after option 1 treatment are characterised by a moisture content in the material (before and after cyclic test) corresponding to a relative humidity of 65 % and a temperature of 20 °C.

The values for internal bond after option 2 treatment are characterised by a moisture content in the material (before the boil test) corresponding to a relative humidity of 65 % and a temperature of 20 °C.

Applications in construction – detailed comparison and the matching panels P1,P2,P3,P4 &P5

1) Interior wall and ceiling linings



Situation	Suitable types	Notes
Dry rooms (bedrooms, offices, corridors) – non-load-bearing linings	P1, P2	P1 for basic/hidden linings, P2 when you want better surface for laminates/paint.
Decorative wall panels, feature walls (dry)	P2	Furniture/facing grade, usually melamine- or HPL-faced.
Humid rooms (kitchens, bathrooms, laundries) – non-structural linings	P3	Moisture-resistant; reduced swelling compared with P2.
Structural sheathing/bracing on internal side in dry buildings	P4	Load-bearing, but only where humidity is low (service class 1).
Structural sheathing/bracing in humid buildings (e.g. external timber walls, unheated spaces)	P5	Structural and moisture-resistant for service class 2.

2) Floors, subfloors and decking



Situation	Suitable types	Notes
Floating floor underlays, non-structural boards in dry rooms	P2	As a base under finishes, not spanning structurally.
Structural floors over joists in dry, heated buildings	P4	Designed to carry load; used like structural plywood/OSB in dry service.
Structural floors over joists in kitchens, bathrooms, entrance areas, unheated rooms	P5	T&G moisture-resistant flooring; survives construction wetting and in-service humidity.
Subfloor over concrete slab in humid ground-floor zones	P5 (sometimes P3 if non-structural)	P5 when the board is part of the structural deck; P3 only as non-load-bearing layer.
Temporary site platforms, stages (indoor, dry)	P4	Structural class for temporary works in dry conditions.
Temporary platforms, walkways that	P5	Better choice where there is regular

Situation	Suitable types	Notes
<i>may get wet</i>		<i>wetting/rain during use.</i>

3) Partitions and internal walls



Situation	Suitable types	Notes
<i>Light non-load-bearing partitions in dry interiors (offices, shops)</i>	<i>P2</i>	<i>As lining on studs; not counted as structural bracing.</i>
<i>Non-load-bearing partitions in humid rooms (sanitary areas, laundries)</i>	<i>P3</i>	<i>Offers moisture resistance; often faced with laminate or tiles.</i>
<i>Structural/racking panels in internal walls (dry)</i>	<i>P4</i>	<i>Used where the board contributes to bracing or diaphragm action in dry areas.</i>
<i>Structural timber frame walls in service class 2 (e.g. external walls, unheated corridors)</i>	<i>P5</i>	<i>Suitable for racking boards in humid conditions, often behind façade systems.</i>

4) Roof decks and attic floors



Situation	Suitable types	Notes
<i>Warm, dry roofs with little moisture risk (inside envelope)</i>	<i>P4</i>	<i>Structural in dry service; often used like OSB/plywood.</i>
<i>Roof decks exposed to rain during construction, or roofs in humid/unheated spaces</i>	<i>P5</i>	<i>Structural plus moisture-resistant; better safety against swelling and loss of strength.</i>
<i>Attic storage decks in dry, insulated roof spaces</i>	<i>P4</i>	<i>For load-bearing boards spanning between joists.</i>
<i>Attic decks in unheated, more humid lofts</i>	<i>P5</i>	<i>Preferred if condensation or occasional wetting is expected.</i>

5) Formwork and temporary works



<u>SITUATION</u>	<u>SUITABLE TYPES</u>	<u>NOTES</u>
<i>Internal, dry temporary decks or jigs (no wet concrete)</i>	<i>P4 (sometimes P2 for very light duty)</i>	<i>P4 when it must carry load; P2 only for light, dry jigs and templates.</i>
<i>Reusable concrete formwork, beams, columns, slabs (exposed to wet concrete and weather)</i>	<i>(P5 for heavy-duty)</i>	<i>Usually P5 core with or without melamine/film faces; P4 is not suitable due to moisture.</i>

6) BUILT-IN FURNITURE AND JOINERY ON PROJECTS



<u>SITUATION</u>	<u>SUITABLE TYPES</u>	<u>NOTES</u>
<i>General built-in furniture (wardrobes, cupboards, shelving) in dry rooms</i>	<u>P2</u>	<i>Standard carcass and shelf material.</i>
<i>Low-cost built-ins, back panels, closet linings (dry)</i>	<u>P1 OR P2</u>	<i>P1 only where loads are very low and the panel is hidden.</i>
<i>Kitchen, bathroom, laundry furniture</i>	<u>P3 (OR P5 WHERE PARTS ARE STRUCTURAL)</u>	<i>P3 for moisture-resistant carcasses; P5 if a base panel is also structural (e.g. spanning supports).</i>
<i>Heavy-duty furniture that structurally spans (long benches, high-load shelving) in dry rooms</i>	<u>P4</u>	<i>Higher strength and stiffness than P2/P3.</i>

Quality control center
General department for testing
Chemical products, building &
Construction materials

**Test Report for particleboards
EOS C2/3-1**

Sample submitting entity : Agrona for Manufacturing and Trade
Date of sample submission : 21 / 2 / 2022
Submitted sample : particleboards
Assigned Laboratory : Wood & Furniture Laboratory
Code No. : K / W / 2 / 2 / 2022
No of Report pages : 1 page
Customer Requirements : Analysis of (Modulus of Elasticity , Modulus of Rubture , Internal bond)
according to ES 5752/2012 , Formaldehyde content according to
ES 3596-5/2008

Date of reporting issuance on : 10 / 3 / 2022

Inspection and testing have been conducted on the sample submitted by the customer requirement tests (Modulus of Elasticity , Modulus of Rubture , Internal bond) according to ES 5752 /2012 (particleboards - specifications) , Formaldehyde content according to ES 3596-5/2008 (wood based panel - part (5) determination of formaldehyde content) , and the results were as follows:-

Test	Results
1- Modulus of Rubture (N/mm ²)	16
2 - Modulus of Elasticity (N/mm ²)	2766
3 - Internal bond (N/mm ²)	0,65
4 - Formaldehyde content (Mg/100 gm)	Not detected

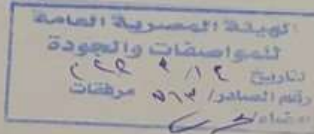
It is noteworthy that the testing of this sample is not representing anything except itself and it is not permitted to rely on this testing results for approval of quantitative production or for approval if any commodities in tenders or purchasing practices or in exporting. This testing results report could not be authorized as a conformity certificate.

General Manager

Ch / Hesham Mostafa Mohamed

Head of section
Hanya Mohamed
10/3/2022

manager of Dept
ASHRAF Aly ABDELAL
10/3/2022



Product certificate shows Agrona's panels surpassed P1,P2, P3, P4, and P5 boards specs.



AWARDS AND GRANTS ACQUIRED

Agrona has been presented on many global stages, been alumni in the global circular valley accelerators in Germany in 2024 and have won the first place in JEC World Composites competition 2023 in Paris for delivering the highest sustainable technologies in the composites field.

Two times finalists at South-by-South West (SXSW) Austin Texas 2020, 2021.

Won the first place at MIT startup competition 2021 and the people choice award in the Global Social Venture Competition (at UC Berkeley) 2019.

SPECIAL PROJECTS:



Washing machine-top project



Floor slabs for marine applications



Home Roofs in upper-Egypt

TEAM

MANAGEMENT TEAM

[Mohamad ElKafafy, CEO- R&D Manager]

[Mohamad ElKafafy, MSc. is the CEO and the R&D Manager. His academic experience in the R&D of renewable material and he has more than 10 years of experience in the manufacturing field, managing mega projects and establishing and installing of new production lines with budget exceeded 10 Million USD.]

[Mohamad Radwan, CTO]

[<https://www.linkedin.com/in/mohamed-radwan-behery-817a8428>]

Mohamed Radwan is the Chief Technology Officer (CTO) of Agrona, where he leads the machinery production and design operations, ensuring maximum efficiency and innovation in industrial processes. With deep expertise in composite materials and mechanical design, he also serves as a Mechanical Design Engineer at Premier Composite Technologies, contributing to high-profile global projects — including the prestigious Shamiyaa Expansion of the Holy Haram in Makkah. His career reflects a unique blend of visionary leadership, technical mastery, and hands-on experience in driving engineering excellence from concept to large-scale execution

[Yasmin Allam, PR & Communication Manager]

[Yasmin was granted the degree of Bachelor of Science Cum Laude in Renewable Energy Engineering from the University of Science and Technology, Zewail City Aug 2018. Yasmin has been an advocate of sustainability for the past years, promoting the role of interdisciplinary scientific research as the most effective way to develop significant solutions to global problems. She joined the Youth Advisory Council (YAC) which was supervised directly by Prof. Ahmed Zewail as project manager of the YAC Award for Youth Creativity, which is an initiative proposed to spread the idea of scientific research among high school students. In addition, she led the hosting team in manifold conferences such as the International Conference on Renewable Energy (INCORE 2016) held by (ANSOLE), the Annual Undergraduate Scientific Conference (2016) at Zewail City, and the Annual Conference on Nanoscience 2017. She also represented her department in the International Conference on Math and Information Technology (ICMIS 2016).

Yasmin's vision is to influence some girls who are interested in sciences but are indecisive to go into a career in it because perhaps not finding enough women doing that has sent them a subliminal message that this's a strange path to take. "It's not, and this shouldn't be the case."]

[Hisham Sobhy, Operation Manager]

[<https://www.linkedin.com/in/hisham-sobhy-16237846/>]

[Hisham Sobhy is the Operation Manager. His background is mechanical engineering; he has worked in the manufacturing field for about 10 years in the operation field managing the manufacturing processes in many multinational processing industries lead teams of 100 + of operators and engineers]

[Ahmed ElMehy, Supply Chain Manager]

[Ahmed ElMehy is the Supply Chain Manager. His background is mechanical engineering; he is has 6 years of working experience in agri-residues supply chain. Ahmed has established the supply chain of agri-residues supplies to a new factory in Upper Egypt that is manufacturing plywood from palm tree.]

[Eslam Rizk, Machine Design Manager]

[<https://www.linkedin.com/in/eslam-rizk-168b3918/>]

[Eslam Rizk is the machine design engineer. He is responsible in localizing many parts of the production line. A team of 6 engineers working with Eslam to attain this goal. Eslam's main experience in machine design working in many global companies for CAD software training and he was the design manager in a big truck manufacturing company.]

[Salsabil Ziad, business developer]

[<https://www.linkedin.com/in/salsabil-ziad-27b573228>]

Salsabil Ziad is a Business developer at Agrona, focusing on business research and strategic planning. She plays a key role in exploring and opening new markets to support the company's global expansion.

ADVISORS

[Munaf Emam, COO @ Innoventures Egypt]

[<https://www.linkedin.com/in/munafemam/>]

[An international Managing Director with strong commercial acumen and senior level executive experience across multiple sectors. Able to confidently and effectively develop robust commercial strategies and lead businesses towards sustainable growth and profit maximization:

- Business management experience in a career spanning 34 years across 3 continents
- Commercial and operational strategist who has developed and mentored over 30 start-up businesses
- Background in Sales, FMCG, Retail, Hospitality, Manufacturing, Ecommerce, Distribution, B2B and B2C]

Factory Operations

https://drive.google.com/file/d/1tm1i3ACAcclH6_CmzRzp7JaRdR09A8x2/view?usp=sharing

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