



NOVA-AYOUS CLADDING TECHNICAL SPECIFICATIONS



Process Title:

This specification describes the performance of Novathermowood exterior cladding (thermally modified wood), related materials to be used, installation, and the method and details of wooden cladding.

Process Description:

The dimensions of the carcass specified in the Project and detail images, 2-layer laminated and finger-joint attached, Nova-Ayous carrier carcasses with suitable profile type to the dimensions of the Nova-Wolf Mouth for the end parts over these carcasses described in the architectural projects are of Nova-Ayous cladding. Also, the manufacturer companies must install the cladding application according to recommended specifications in regards to D4 norms with polyurethane glues and stainless A2 screws or nails taking into consideration the temperature, humidity, and sound insulation details specified in the architectural projects.

Before and after all these processes, the coatings to be used in 6 sides of the Cladding board are UV Resistant, primer varnish containing pigment, and protective surface treatment with the quantity and methods specified in the technical documents of the paint or oil manufacturer.

All the required equipment, workforce, loading in workplace, horizontal and vertical transportation, unloading fee, contractor profit, loss, wastage, and general expenses include 1 (One) m2 of the price for all this process.

Thermowood Cladding Technical Specifications:

- As a result of high heat applied, the cellulose chains break down, acids dissolve, and microorganisms are destroyed. The habitat of wood-rotting fungi is substantially eliminated.
- Most of the resin is discarded and the rest is crystallized.
- The humidity of the wood is reduced to the range of 4-7% all over.
- It is produced without using any chemicals in the process, the material is 100% natural.
- It is environmentally friendly, healthy and 100% recyclable, which does not pose any threat to human and animal health.
- It is resistant to different climatic conditions and is long-lasting.
- Compared to Air Dried and Kiln Dried woods' performance, cycle, bending, etc, deformation dispositions are reduced and its stability is increased.
- Its resistance against plant and animal wood pests has been increased.
- The inner and outer color of the wood has become homogeneous.
- Heat and sound insulation have been increased compared to kiln-dried wood.
- Its flammability has slightly decreased compared to normal wood.
- Polish, paint, and oil retention properties are improved.

Description of Cladding Material:

Outdoor Material made resistant to different climate conditions in compliance with the International Thermowood Association standards and European Norms (DIN CEN/TS 15679:2008-03). International Thermowood Association certified that Nova-Ayous is the kind of wood which produces without using any chemicals and without deteriorating the natural structure of the wood with 200°C-212°C or above heat temperature.



nova^{thermowood} Ayous Cladding Dimension:

Wood Specie : Thermowood Ayous
Thickness : 18/ 20 mm
Width : 92 / 120/ 140 mm
Length : 1000 - 4000 mm

Dimensional Tolerance; Length: ± 1 cm, Width: $\pm 1,5$ mm, Thickness: ± 1 mm

Carcass (Wooden Under-Construction):

Outdoor Material made resistant to different climate conditions in compliance with the International Thermowood Association standards and European Norms (DIN CEN/TS 15679:2008-03). International Thermowood Association certified that Nova-Ayous is the kind of wood that is produced without using any chemicals and without deteriorating the natural structure of the wood with 200°C-212°C or above heat temperature.

40 mm x 40 mm free lengths, 2-layer laminated, finger jointed, Nova-Ayous carcass (under construction), forms the basis of the cladding application. Therefore, utmost importance to material choice should be given.

The right cladding application starts with the right carcass selection, therefore the fact that the cladding and under-construction materials have the same humidity rate will result in the same working behavior and will ensure proportionality.

For this reason, it is recommended to use carcasses that have undergone Thermowood process.

nova^{thermowood} Ash Carcass (Under-Construction) Dimensions:

Wood Specie : Thermowood Ash (2-layer laminated, finger-jointed)
Thickness : 40 mm
Width : 40 mm
Length : 1000-3000 mm

Cladding Profile Types:



Nova-Wolf Mouth Detail:



Cladding Grade:

Nova-Ayous Extra (knot-free) cladding materials must be knot-free on one side. On the underside (in the invisible part), cases such as knots, profile knife marks, and measurement failure, can happen due to the natural texture of the wood. For detailed information, the manufacturer's quality class document should be reviewed.



AUXILIARY MATERIAL FEATURES TO BE USED DURING INSTALLATION:

Screw/Nail:

In Novathermowood Exterior Cladding Applications; for visible or invisible attachments, screws or nails known as AISI 304 quality made of stainless steel, containing 18% chromium, 9% nickel, 4% copper, and A2 coded as stainless are recommended to use. In these applications, It is important to use screws of appropriate dimensions for the cladding and the under-construction.

For tight visible or invisible joint connection of two wood boards, A2 half-thread stainless steel screws are to be preferred. If using a pistol shot nail, the preferred A2 stainless nails will prevent possible corrosion.

In visible applications made from the top, it is recommended to use A2 stainless screws with cylinder/decorative head and stabilizing teeth suitable for cladding and lower carcass.

A4 stainless coded screws, made of stainless steel, known as AISI 316 quality are recommended to use in places exposed to seawater. Choosing the right screw will prevent rust formation and provide trouble-free assembly.

Glue:

On surfaces (adhered surfaces) where the cladding to carcass and carcass to the wall are joined, it is recommended to use polyurethane-based water-resistant glue or NP1 suitable under D4 norms.

The glue to be used must be resistant to variable weather conditions, resistant to air moisture combined with UV rays, silicone-free, Anti-aging with superior adhesion strength in many different wood species.

Application:

The application should be done between +7°C file +35°C temperature. The surface on which the glue will be applied must be free of dust, oil, and dirt.

Glue must be applied according to the width of the wooden part; at certain intervals horizontally or vertically, for creating air circulation in the form of "ES".

Paint/Varnish/Oil:

For the cases such as; delaying color fading caused by UV rays, protection against stains left by the rain, preventing the formation of surface and head cracks, the cladding and cladding coatings must undergo a correct surface treatment.



General Information:

Paints or Oils to be used;

- Suitable for Thermowood and exotic woods.
- Suitable for the resin outdoors structures and resistant to yellowing
- The entire system must be water-repellent and vapor-permeable.
- It is important to use products containing pigments that are resistant to UV rays.

Proper surface for treatment;

- At least one coat of the recommended 'paint', 'varnish', or 'oil' should be applied to the 6 surfaces of The wood before installation.
- The process should be done according to the specified quantity and method in the "Technical Data Sheet" Of the manufacturer.
- Applications should not be made under sunlight or rainy weather.
If rainfall is expected, a 2-days rain protection period should be considered.
- The temperature of the application area should be between 15°C-25°C and the relative humidity should be Below 75% during the application.
- Before the application, wood should be cleaned of dust and other foreign materials.

For Cladding;

Oil (non-film-forming), varnish (film-forming), or paint can be preferred for cladding boards.

The point to be considered is that the periodic maintenance of products using oil should be more frequent.

Transparent Colored Oil: Good penetrating film, non-film-formings, seasonal easy maintenance, Oils, and preservatives containing UV resistant pigments should be used on Novathermowood Exterior Cladding. In such products, colored materials that do not change the texture and natural beauty of the wood should be preferred. A minimum of two coats should be applied on the top layer before the assembly.

The material must be thoroughly soaked into the wood. Rough Sander causes surface smoothness and increases the durability of the coats. The application should be done with the help of a brush or roller. To get a homogeneous look, it is recommended to apply in the direction of the grains in the wood. The process should be done according to the specified quantity and method in the "Technical Data Sheet" of the oil manufacturer.

Transparent Color Varnish: Before installing Novathermowood Exterior Cladding, it is important to use A suitable primer that penetrates the wood and contains UV-resistant pigment. The first coating of Primer and varnish must be applied before assembly.

Varnish can be applied in 2-3 layers totally. Rough sanding increases surface smoothness and strength Between layers.

Primer application should be done by brush, dipping, or showering and Varnish application should be done With the help of the brush, roller, or airbrush. The process should be done according to the specified Quantity and method in the "Technical Data Sheet" of the Varnish manufacturer.

Note 1: Formation of a smooth and sufficient film in varnishes is very important for durability, from this perspective the primer application with dipping and varnish application with the airbrush is our first preference.

Note 2: It has been observed that the durability of the professional systems using primer+ varnish gives better results compared to non-primer self-colored, "varnished wood protector" (wood stain).



Covering Lacquer Paint: Before installation, the usage of a primer penetrating the wood is very important. After lightly sanding, the primer should be applied using a "barrier middle layer paint" pistol. Middle coat paint should be applied without sanding and the top layer should be applied 1 or 2 coats with a brush, roller, or pistol.

The process should be done according to the specified quantity and method in the "Technical Data Sheet" of the Paint manufacturer company.

Note 1: As with most exotic woods, it is important to apply white and light colors "barrier intermediate coat paint" for Novathermowood Exterior Cladding, especially against vomiting.

Note: It is recommended to use suitable products to the low rate of VOC (Volatile Organic Compound) in terms of human and environmental health and EN 71-3 (Toys Safety Regulation).

Surface products should not contain heavy metals harmful to human health. In the products; **Arsenic, chromium, copper, lead, mercury, aluminum, barium, boron, zinc, cadmium, tin, cobalt, manganese, nickel, strontium, and selenium**, and such heavy metals must be below the specified limit.

Insulation:

To maintain predicted insulation values of the building for a long time, heat insulation due to related factors of climate and humidity must be protected.

In the design of a cladding construction layers for the structure, external physical factors such as; sun-rays, rain blown by the wind, snow, wind, dust, dirt, sound, and the dusting of mineral wool insulation, as well as internal factors, should also be considered. Due to temperature differences of the interior and exterior of the building, the formed water vapor in the interior with different pressure and the hot interior air flowing from the cladding moves to the outside of the structure where it cools and causes condensation damage and a significant loss of energy.

For this reason, while using rock wool for heat and/or sound insulation, a steam stabilizer should be used for wall covers against all these internal and external factors.

These covers must be, high steam permeable (Sd value < 0.50 m) conforming to TS EN 13859-2 standard, waterproof at the highest level (W1), fire class at least B-s1 according to EN 13501-1, and the breaking strength at least MD 250/ CD 200 N/5 cm after artificial aging according to EN 12311-1. In open joint cladding designs, The vapor permeable waterproofing cover must be high UV resistance. UV resistance of the covers must be up to 20 mm or 50 mm suitable to open joints. Heat insulation should be at least 50 mm thick, 150 kg/m³ density, A1 fireproof, heat transfer coefficient 0.035 W/mK on the mineral wool base. Vapor-permeable cladding covers can be applied directly on Rockwool. There must not be any space between the Rockwool and the covers. However, there should be a gap of at least 2-4 cm between the cover and the cladding board. The windproof design of the cladding increases the energy efficiency of the construction. For this reason, in case there is not a self-adhesive overlap edge of cladding, then according to the manufacturer's advice in overlays, anchorage attachments and windows details sealing materials should be used.

For heat and/or sound insulation, the stone wool which is used should run together with the carcass system. In case, if the insulation damages during the carcass application, then it may create a bridge. For heat and/or sound insulation the material which is used must be non-combustibility in terms of fire safety. Therefore, It is recommended to use rock wool instead of flammable insulation materials. The steam Stabilizer to be used on the cladding should also prefer to be in the minimum flammable class. So as not to occur the heat bridge, It is recommended to use insulated anchoring material.

In case the cladding construction is designed as a drywall system, it is preferred to use concrete, or A1 class fully adhering to non-combustible plasterboard surfaces, vapor permeable, waterproof, high fire-resistant cladding coverings.



To control the discharging of hot air and to stop airflow from indoors to the cladding layer, steam retardant or steam repellent covers can be used in the warm side of the insulation. These covers, which are produced under the TS EN 13984 vapor control layer standards, can be laid indoors over the hot side directly on rock wool or glass wool hot insulation. The sealing, plumbing, and connections of cables, pipes, and overlays should be considered as per the manufacturer's recommended material.

COMPONENTS OF METAL UNDER-CONSTRUCTION SYSTEM:

BRACKETS:

Brackets in 3 mm thickness, fixed and movable heat-insulated, clip-on, 6063 T6 quality, aluminum brackets.

Features of Profile and fixing Materials:

- T and L profiles with 2 mm thickness, black or natural anodized, 6063 T5 quality aluminum
- 4,8x16x20 aluminum width head pop rivets, according to DIN 7337 A standards
- Screws are of DIN 7504 P standards, A2 quality stainless
- Steel dowel, M10x96 , (ETA-05/0069) A4 quality stainless steel, with clip, option 1, seismic concrete Anchor
- Plastic dowel, M10x100, according to (ETA-07/0121) norm, A4 quality stainless, steel screw, which Should be wall anchors suitable for use on brick and gas concrete walls.

Installation:

At the Novathermowood exterior cladding application area, the horizontal distance of T profiles should be 50cm maximum. By adding a gap of 2-4 cm between the insulation and wall cover as an opening for the Cladding, the length of the bracket to be used must be determined.

In the direction of the vertical axis, aluminum fixed brackets are fixed on reinforced concrete surfaces with steel dowels, and aluminum movable brackets are fixed on brick wall surfaces with plastic dowels. If pumice block is on wall surfaces, chemical dowels should be used.

The vertical distance between the brackets should be a maximum of 90 cm. Afterward, the thermal insulation boards are applied to the entire facade with the thermal insulation board dowel, so that there are no gaps. The vapor stabilizing cover on the thermal insulation board is covered on the facade by Making an overlap of 10 cm at the joints and passing it to the bracket through the slot that is cut neatly with a utility knife at the parts corresponding to the brackets. Joints and parts corresponding to the Bracket are taped with a special tape to ensure water tightness. Then, the aluminum T profiles, which Are leveled horizontally and vertically, are attached with wide head pop rivets to work from layer to layer. Therefore, T Profiles are fixed to the fixed brackets on the concrete of each layer by fixing them end-to-end with a gap of 8-10 mm Between them. This addition should not be fixed on the movable bracket nor by adding them in the empty space end-to-end. Pop rivets are applied to the round holes in the fixed bracket and the link holes in the movable bracket. Thus, preventing the deformation of the T profile in thermal expansions.



POINTS TO BE CONSIDERED BEFORE AND AFTER APPLICATION:

novathermowood Surface to be coated on cladding:

The surface to be coated must be on the gauge and plumb line. If it is a brick wall, before the carcass installation a minimum of 2 cm thick rough plaster should have been applied (It must be calculated in the building statics).

The connecting element between the wall and the wooden frame (Bracket) in the carcass application to be applied on the soft building elements (ytong, brick, briquette, etc.) of porous wall coverings other than a brick wall, should be attached with plastic screw dowels to the wall. In buildings with such kinds of infrastructures, the installation of carcass layer on the moldings forms the backbone of the process. The Infrastructure takes its major part from the bonding process to the layer moldings. In the case of a curtain concrete wall, the installation can be started by fixing the carcasses to the wall. If it is applied to metal construction, first it is necessary to choose the most suitable screw for novathermowood wooden carcass to be screwed in a secure way on the construction. If a thick metal is used, attention should be paid to the selection of the screw, taking into account the metal fatigue that may occur in the screw during screwing.

Under-Construction (Carcass):

While applying Novathermowood cladding, it is necessary to use Novathermowood carcass for under-construction, when metal profiles are used as a carrier construction carcass, these profiles should not be installed directly to cladding boards. The use of carcass will provide ease of installation, as well as eliminate the incompatibility caused by different heat expansions between metal and wood. First of all, these profiles should be fixed to wooden carcasses and then Novathermowood cladding boards must be installed on wooden carcasses. The dimension of carcasses with an air gap of 2-4 cm between the cladding and the wall cover needs to be determined. Contact with surfaces such as the wall, isolation etc. behind the cladding facade must be avoided. Make sure that the carcass system is screwed securely so that it can support the cladding. In the fixing of carcasses, high-strength torsion, stainless steel screws or buldex should be used. Screw spacing should not be more than 60 cm. The distance between carcasses must be calculated between 40-60 cm. Through these distances, the needed air circulation will be provided.

Application Direction and Air Circulation:

Novathermowood exterior cladding's tongue-and-groove should be applied in a direction that provides the flow of water and does not create ponding; lamp (male) on top, tenon (female) in downside. In the assembly of cladding, glue/NP1 and stainless nails or screws shot with an air gun are used. Be careful That the nail to be used must be stainless. Nails should be thrown from the tenon part of the wood so that They are not visible from the surface. All details of wooden cladding should be fixed in such a way that provides the necessary air circulation so That the wood can dry and breathe.



Briefly;

- Air circulation is important for wood to dry and breathe.
- At the joint points of cladding boards with carcasses, it is beneficial to use polyurethane or NPI According to the D4 norm
- Elements should be built behind the facade cladding to prevent water intake.
- The head parts of the cladding boards must co-inside with the carcasses.
- At least a 2 mm working margin should be left in the tongue and groove and the backside joints of the cladding board, thus, the spaces in the front joint of the cladding with a lath of specified size can be adjusted.
- Facade cladding should be finished 30 cm above ground level. In this way, possible staining on the wood due to the rainwater splashing and the snow level rising from the ground will be prevented.
- The rear parts of the Cladding's corner joints must be resting on the carcass. Working space must be given on the front and back sides of the corners.
- The ending elements of the wooden cladding should be adjusted in such a way as to leave working margins considering the total number of the paneling and the height of the cladding. In high buildings, dilatation space between the layers must be given.
- At least a 2 cm gap should be left at all endpoints of the boards (wall, floor, etc.).
- The head parts of the wood should not expose directly to water.
- Preservatives such as oil and varnish must be applied to the cut heads of wood.

Delivery, Control, and Storage:

All technical and application details, test certificates, warranty documents of all materials to be used in Manufacturing should be checked by the employer or employer's representative upon request. Nova-Ayous Cladding products must have TSE CEN/TS 15679 TMT certificate. Information about the physical properties, Size, pattern, color, and performance of the material should be delivered to the representative. Materials That do not comply with the standards should not be used.

When Thermowood products arrive at the construction site, at least three test samples (30-50 cm length), To be taken from the incoming packages and be sent to the Forest Industrial Engineering department of Istanbul University Faculty of Forestry and the test fees must be paid by the contractor company.

All technical and application details, test certificates, warranty documents of all materials to be used in Manufacturing should be checked by the employer or employer's representative upon request.

Necessary tests for Nova-Ayous cladding products are made by the relevant institutions, and a report is Obtained. Otherwise, it is the employer/contractor's responsibility to make the necessary tests and prepare the reports.

All accessories to be used during installation and auxiliary elements in these accessories must be Compatible with Novathermowood products. The entire system must be checked before delivery. If there is Any damaged wood, it must be repaired before acceptance. If not repairable, it should be replaced.

The material brought to the construction site should be stacked in a suitable and closed stock area that is Safe, clean, and has suitable waiting conditions before assembly.

The woods brought to the site ready for installation should be stored on pallets on a dry surface, in the Manufacturer's original packaging in such a way that it will not be damaged, and protected from outside Weather.

Until the installation begins, novathermowood cladding materials are recommended to be stored in their Original packaging. Again if there are cladding materials that need to be packaged, storage conditions Similar to their original packaging must be provided. When the products are delivered, the condition of the Packages must be checked.