Japan Wood Brand

Excellent Japanese Wood Products and Technology for Your Better Life

Cover photo: Mie Prefecture Kumano Kodo Center (Owase City)

INTRODUCTION

As regards Japan's forest resources, many of the artificial forests of Sugi, Hinoki, or Karamatsu (Japanese Larch) planted from the 1950s are now ready for logging.

Interest in export of Japanese lumber to foreign countries rises as the use of eco-friendly wood for contributing to global warming prevention, promotion of forest maintenance and revitalization of the regions has been reviewed, and also growing industrial policy of our national forestry has been promoted.

Worldwide, wood supply from other countries plays a very important role to compensate for the supply-demand gap for those who cannot supply to meet their domestic demand only by the domestic resources, where wood demand has greatly increased with rapid economic development.

Under such circumstances, in recent years, the amount of lumber production from abundant artificial forest resources has increased in Japan, which can not only meet the increasing need of domestic use but also be enough to export to other countries to satisfy their individual needs for lumber.

In the future, in order to further expand wood export from Japan, it will become crucial for Japan to introduce wood products with high added value by processing Japan's excellent wood with our advanced processing technologies.

This brochure, published with the support of the Forestry Agency, introduces wood products with excellent performance.

It also provides detailed information of the principal tree species in Japan, with the hope that it will be of use widely for everyone who deals with Japanese wood products abroad.

October, 2017
Japan Wood-Products Export Association

Japan, having a temperate and humid climate with four distinctive seasons, has an abundance of lush vegetation.

But then, heavy rainfall and typhoons and lightning storms often result in frequent natural disasters, not to mention countless earthquakes. For this reason, nature though being familiar, had been a subject of awe for the Japanese. Therefore, the climate where forests and big trees were worshipped as sacred was shaped, and "tree culture" or “wood culture” in which people coexist with and utilize nature has nurtured.

In Japan, lumber has been continuously utilized from the old times to the present for buildings, houses or daily necessities while there are lots of natural disasters, etc.

For this account, wood products with unique functions, such as durability and fire resistance that can withstand natural disasters and fires, had developed.

In Japan, forest resources, mainly being the artificial forests, are reaching their mature stage, and the majority of them are ready for logging. By cutting down mature plantations, and reforestation, we can maintain healthy forests. To maintain this cycle, it is necessary to make effective use of the cut lumber.

For this reason, it is important to expand the demand for lumber, and as one measure, we encourage export of Japanese wood, in particular wood products with high added value.

In Japan, there are plenty of wood products with high performance of advanced processing technology including lumber with performance such as durability and fire resistance, flooring material corresponding to ondol, yakisugi referring to Japanese traditional cedar, and colored lumber, etc.

This brochure introduces Japan's wood products of high performance by advanced processing technology to spread them wide globally. Furthermore, objective data, applications, effects, and other information supporting the quality performance are also provided.

It would be our pleasure if this brochure can give you a chance to learn about Japan's lumber products of high performance created by advanced processing technology and to utilize them wide globally.

October, 2017
Forestry Agency, MAFF

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Japan Wood Products

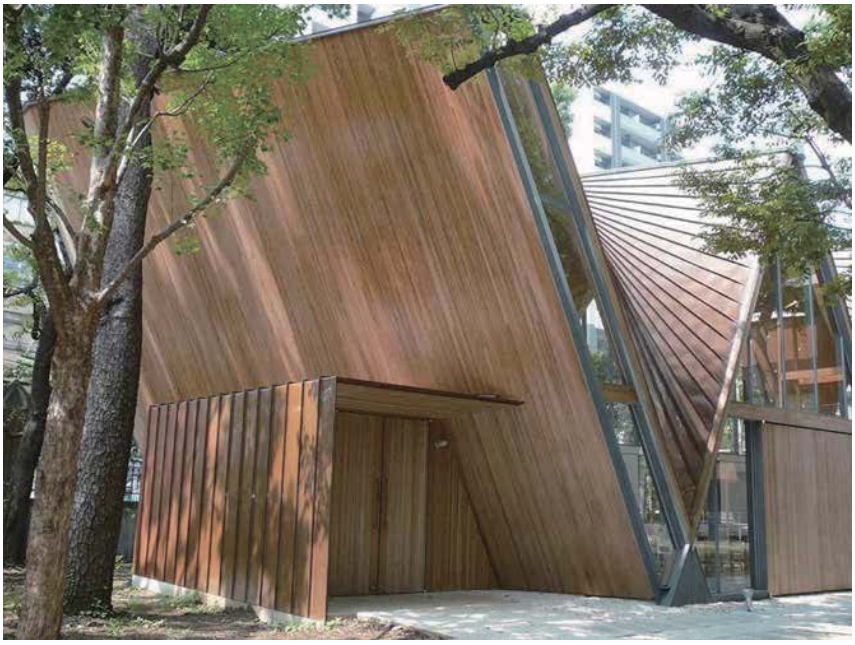
Representative Wood in Japan

Japan Wood Products

High Quality
High Performance
High Technology

High-Temperature Steam Treated Wood

The heat treatment technology, which improves durability and dimensional stability by heating wood, was developed in Finland, a country of forests and water. Applying the Finnish technology in Japan, we have improved it to a new heat treatment technology called *Steam Treated High-Temperature Wood Drying Technology* to produce higher quality wood. Using only "heat" and "water" but no preservatives at all as a precondition, we have successfully developed the technology that makes the most of the performance of wood, while maintaining its natural colors. Born in this way, *Japanese Thermo-Wood* is an innovative and environmentally-conscious material made out of wood, of which quality is maximized.



The University of Tokyo Yayoi Auditorium Annex

Production Regardless of Origins of Wood Lowers the Cost

The technology of Thermo-Wood permits high durability and dimensional stability, no matter where the origins of the wood are nor what species they are. By using local materials, more optimized products to the climate of each region can be produced at a lower cost.

J.S.T. Mfg. Co., Ltd.

Ecological Wood That Can Be Recycled

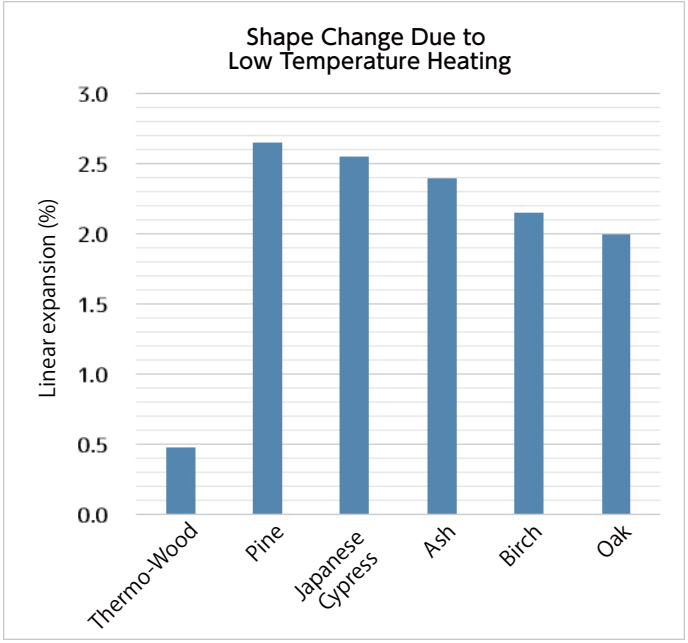
Thermo-Wood is a safe product that does not use any preservatives at all, which is equivalent to solid wood. Therefore, it can be recycled, reuse or utilization as fuel, after using it.

High Durability

Since Thermo-Wood has low water absorbency in spite of its low moisture content, it has high antiseptic performance and is very strong against fungi that can decay wood. Therefore, it is ideal for outdoor use.

Outstanding Dimensional Stability

Thermo-Wood, which is created by the high-temperature wood drying technology, has outstanding dimensional stability. It is suitable for use on visible areas such as exterior walls and fences. It is economical, as it requires merely the minimum maintenance, which means fewer running costs than that for untreated wood.



The first measurement of the width of the test pieces was made after the pre-conditioning. The second measurement was done after the test pieces were humidified for 72 hours in a tub kept at the environment of 30 ℃ and 95 % RH. Thermo-Wood (pine) has linear expansion of about one fifth to a quarter as compared with untreated dried-wood.
Hiroshima Prefectural Eastern Industrial Technology Center (E.I.T. No.11)

Advanced Preservation Treatment with Resins for Wood

Wood decks have become familiar in such areas as housing, public facilities, large commercial facilities, and so on. Their cost performance, however, has been an issue, as repair and exchange cycles are short due to aging such as decay, termite damage, warps, and cracks. The major cause for these is that the treatment for enhancing the durability was only effective for the surface of the materials. Through persist research to develop wood decks with uniform performance of high durability all the way to the inside, they put a product named *Maxelum* into practical applications, owing to the joint project of the Kyoto University Wood Research Institute and a manufacturer. The advanced preservation technology with resins can infiltrate a special resin that observes the strict regulations into not only the surface but also the inside of wood with a specialized autoclave. Extreme durability and safety are actualized with the new technology, unlike conventional wood decks.

Stairway of an elementary school which *Maxelum* is applied. Its moderate softness reduces the impact and prevents accidents when children jump or fall down.

Wood decks in a complex building

Secured Treatment against Decay and Termites

Maxelum, treated with the advanced preservation technology with resins, can suppress proliferation of decay fungi. The technology changes materials to what termites do not prefer so that insect damage hardly occurs. As the materials are laminated after veneers are treated with the resin all over to the inside, it has uniform quality no matter where you cut it, and preservative treatment on the section surfaces is unnecessary.

Benches of *Maxelum* and partly Koshii Super Thermo at the Kincho Stadium in Osaka

Strong against Sunshine and Rain, Various Applications as Outdoor Landscape Materials

The special resin treatment adds the water absorption suppression effect. With extremely-smalldimensional changes and fewer warping and cracking, it is highly durable that can cope with severe outdoor weather. *Maxelum* can be used for various exterior purposes including outdoor wood decks, boardwalks, flooring, waterfront, poolside, benches, playground equipment, pergolas, guide boards, and garden furniture.

Experiments in the Soil

Maxelum found no noticeable degradation or damage caused by decay fungi, termites, and others after being left in the soil for 11 years, unlike its untreated counterparts. The experiments have proven that *Maxelum*, infiltrated with the special resin all the way to the wood core, can maintain high durability even when buried in the soil for a long period of time.

Experiment Period: For 11 years from 1994 to 2005
Photos: KOSHII & CO., LTD.

Nitrogen Heat Treated Wood

The nitrogen heat treatment (S-Tech treatment) technology is attracting interest among those technologies which heat and dry wood to improve its performance. It decomposes perishable components of wood with nitrogen heating above 200 degrees Celsius. This stabilizes the shape of the materials and reduces their weight. The durability has dramatically improved compared with the conventional wood. It boasts a durability record exceeding 20 years even in applications for promenades.

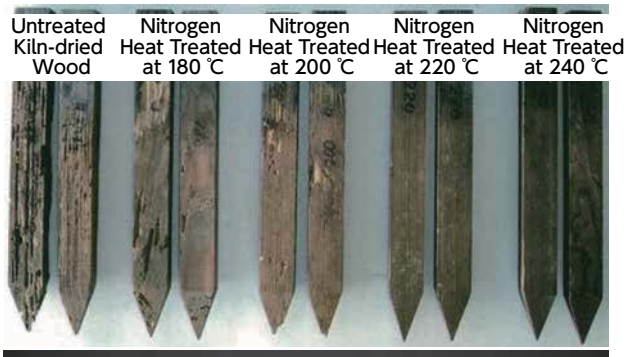
Ebisu Gardenplace Tokyo

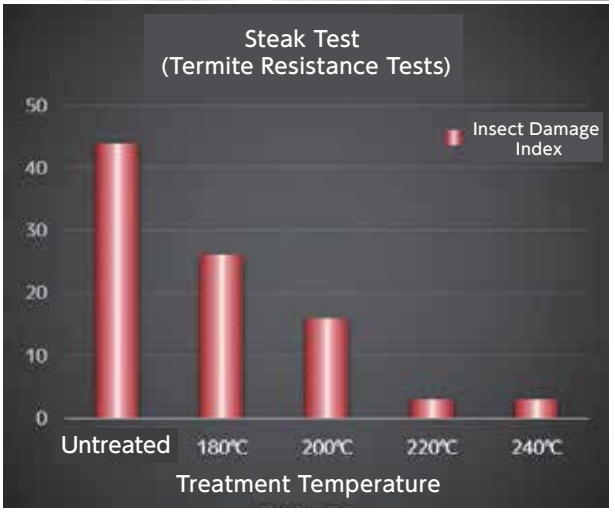
High Antiseptic and Insecticidal Performance Achieved without Chemicals

The S-Tech treatment executes sterilization and insecticide along with the drying process. The effect is sustained for a long time to keep nutrients and moisture at a low level (3% to 7% of equilibrium moisture content) that fungi and termites cannot approach. There is no danger of harmful substances to evaporate, as it is non-chemical preservation with no use of highly toxic chemicals at all.

Excellent in Water Resistance, Dimensional Stability, and Quick Drying

The S-Tech treatment reduces the moisture content and weight of the materials, as well as it changes the cellular structure of the wood to porous. This increases the insulation effect and lowers the radiant heat, making it a suitable material for exterior applications such as wood decks, louvers, fences, outer walls, and so on. In addition, since its permeability of oil paints is about 1.5 to 2 times that of ordinary dried wood, the effects of wood protective paints can be sustained for a long time to retard fading. Furthermore, the modification of hemicellulose keeps moisture, dew condensation, and the like away, resulting in few shrinkage and warps due to moisture. It performs high dimensional stability as well as heat retention effects for heated floors.





No Resins nor Stains

The S-Tech treatment removes resins. Therefore, resins do not come out on the surface after construction, or **brown water does not leach out to soil the surrounding after rain soak.**

Observations and Results of Termite Resistance Tests
(Outdoor steak test)
Date: November 2004
About 2 years passed since the start of the test (November 2002)
Location: Fukiagehama Beach, Kagoshima Prefecture
(where many formosanussubterranean termites are inhabited)
Insect Damage Index
= (Average insect damage level) x (Incidence rate of insect damage)
Executing Agency: Nara Forest Research Institute

Preservative and Termite-Proof Plywood for Structural Use

As environmental issues are more concerned today, the "stock-oriented" housing that people can live for a long period of time is preferred, rather than the housing production as before that repeats knocking down and starting again to give a large burden on the environments. Japan has started to spread high-quality long-life housing, so-called "Superior Super-Long-Life Housing." The new housing policy extends the "average life expectancy" of houses for enriched living circumstances.
It is preservative and termite-proof plywood for structural use that is playing an important role. The advanced preservative and anti-termite treatment on plywood for essential structural parts including floors, walls, and roofs prevents the building from decaying and extends the life of the houses. Deterioration can be sufficiently averted by applying plywood with high durability as the sheathing materials of exterior walls,ground floor, and wet areas which are especially difficult to maintain. It will serve as the basis for protecting houses with high asset value.

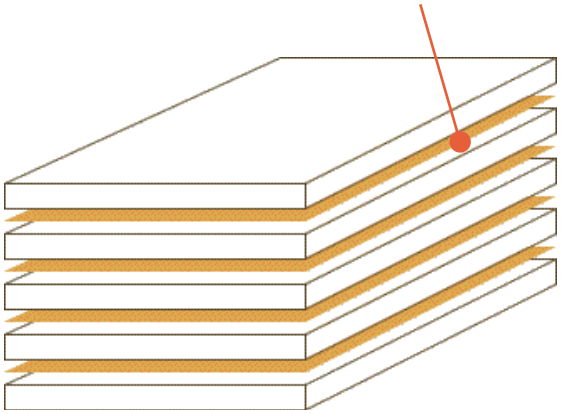
The preservative and anti-termite treatment allows applications for essential structural parts.

Preservative and Anti-Termite Treatment by Pressurized Impregnation Technology for Veneers

The pressurized injection processing performs preservative treatment on veneers before they are bonded into plywood. In a special tank with high pressure, the preservatives are applied in the wood to penetrate deeply into the inside, not only the surface. Its preservative and anti-termite performance is higher than the conventional treatment, which the preservatives are mixed in the adhesive, achieving the highest effect among the wood preservation processing technologies.

Conventional Treatment

Preservation Treatment Only on the Adhesive
(Preservatives are mixed in the adhesive.)

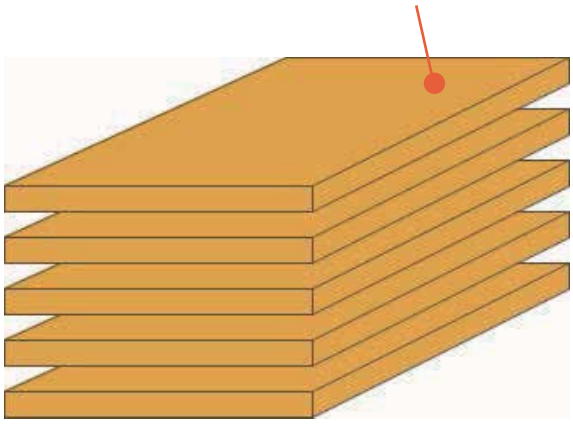


Mixed in the adhesive, the preservatives penetrate only in the adhesive parts of veneers.

Durable for approximately 5 to 10 years.

Pressurized injection Treatment for Veneers

Preservative Treatment in the Entire Veneers
(Preservatives penetrate into the inside of veneers.)



Injected with pressure, the preservatives penetrate not only on the surface but also all over into the inside.

Durable for approximately 30 to 50 years.

Applicable for wet areas and exterior walls.

Thick Structural Plywood

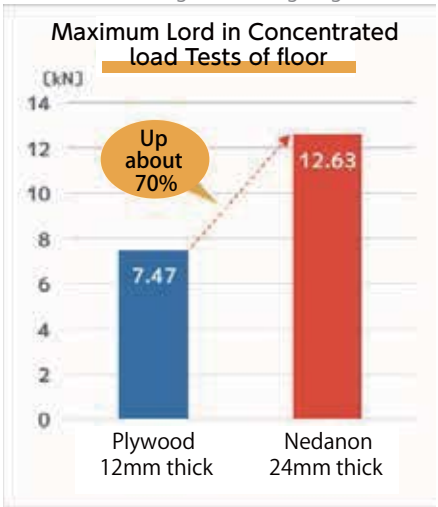
Nedanon as highly-efficient

Nedanon is structural plywood with thicknesses of 24mm and 28mm, which are far thicker than those of conventional items. Main species for this item are Japanese wood such as cedar, larch and cypress. At present, Nedanon is used as the sheathing material of the floor of most Japanese timber houses. By using this item, the structural performance of the floor and thus the building itself has tremendously improved. Production of Nedanon was less than 1% of the national production of plywood in 2000, but in 2016, it accounted for about 38% (approximately 1,160,000 cubic meters).

By using Nedanon, you can omit both horizontal braces and floor joists, which will simplify the construction process and increase the degree of designing freedom.

Seismic Resistance

The seismic-resistance of Nedanon-floor is more than four times higher than conventional floor which is sheathed with 12mm thick plywood. Not only for the floor, Nedanon is also available for roofs and walls, which makes the houses extremely high seismic resistant. When you build a house, you nail Nedanon with 75mm long nails at between 100mm and 150mm spacings. If you use more nails, for instance, at an spacing of 50mm in two rows, you could design extremely high quake-resistant structural subassemblies (floors, walls, roofs). In Japan, middle and large scale timber buildings are being built with those structural subassemblies with high capacities.



Sound Insulation and Fire Resistance

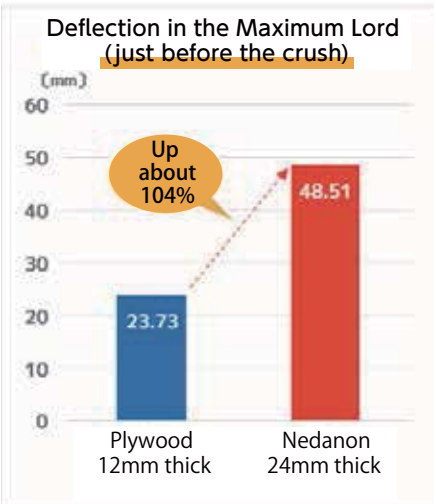
Compared with conventional floor, the sound insulation performance of Nedanon-floor is higher and has less warps and no trouble of floor squeaks. As Nedanon is thick, it is highly fire-resistant, which allows the residents a time-rich evacuation when a fire occurs. This product has obtained the certification for quasi-fire-resistance, so, there are some advantages in designing the floor for apartment houses.

Guaranteed by the Government

Nedanon is a commodity which meets Japan's national standard JAS. And the bearing walls sheathed with Nedanon have acquired the certification for their shear capacities by Ministry of Land, Infrastructure, Transport and Tourism. In addition to them, floors sheathed with 28mm thick Nedanon have been certified as 45-minute quasi-fire-resistant structure by the ministry.

Recycle

Nedanon, after used in houses and when the houses are demolished, becomes the material for particle boards and others. At the end of the products' life, they are used for heat source and power generation as biomass energy.



Reference: Performance Test against Local Loading of Floor in "Nedanon Manual" by Japan Plywood Manufacturers' Association

Laminated Veneer Lumber (LVL)

LVL is laminated Veneer Lumber. To manufacture LVL, we first make 2-4mm thick veneer from logs by a machine called veneer lathe and dry them, which then are layered and glued in parallel to their fiber direction. Plywood is used mainly for sheathing materials, whereas LVL can be used as long components (framing materials) such as posts and beams. In addition, the productivity of this item is high, because almost all parts of its manufacturing processes can be automated.

Station Building

Manufacture in Your Size

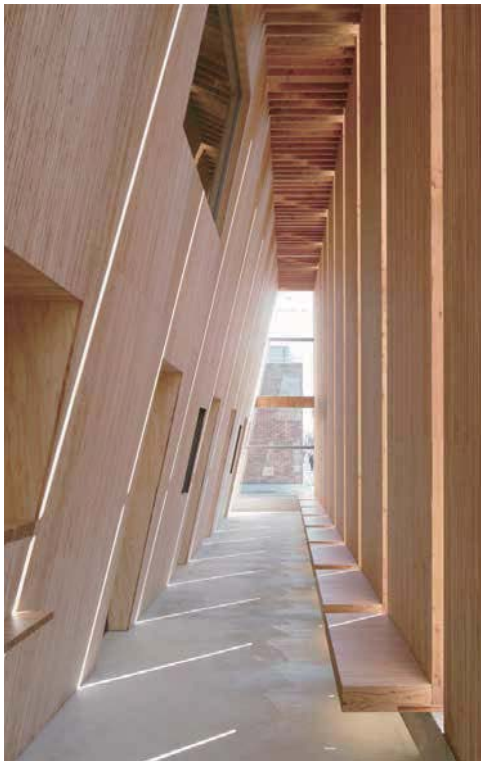
By jointing veneer sheets lengthwise, we can easily manufacture long lumber even from small-diameter logs, warped logs, and short logs such as thinned wood. By adjusting the number of laminated veneer sheets, we can make items in any thicknesses which are suitable for your purposes. We can also remanufacture (cut) the products in requested width and length.

A Wide Variety of Uses

LVL are used in many ways from structural lumber to interior material. It can be used for timber houses (structural and nonstructural uses), industrial buildings (warehouses, gymnasiums, bridges, livestock barns), fittings (doors, window frames, blinds), cars (decks of trucks, and busses), transportation (pallets, packaging, containers), railroads (ties), makeshift facilities (scaffold planks), airplanes (interior), electric parts (household appliance, insulating materials), kitchen goods (cut boards, dishes and bowls, handles of kitchen tools), interior decoration (clocks, ornaments), stationery (writing utensils, chisels), sporting equipment (rackets, golf goods), and musical instruments (pianos, organs, guitars) etc.

Gymnasium of an elementary school

Interior of a restaurant



Interior of a hospital

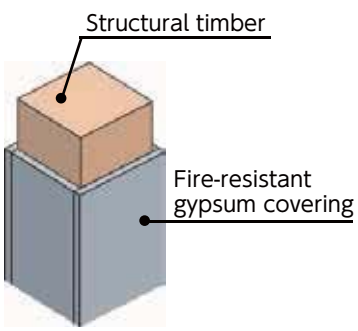
Cafeteria of a university

Exhibition booth

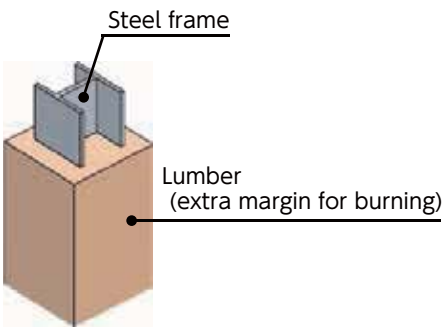
Fire Resistant Laminated Lumber

In Japan, fire resistant laminated lumber items, which are gypsum covered or hybrids of wood and steel, have been developed. FR Wood® is pure wood fire resistant structural lumber made of cedar only. The structural laminated wood, which is located at the center of FR Wood®, is surrounded with wooden layers injected with fire-retardant chemicals. This product enabled us to construct fire resistant timber buildings having the texture of real woody surfaces. FR Wood® can create a space with a warm tone of wood.

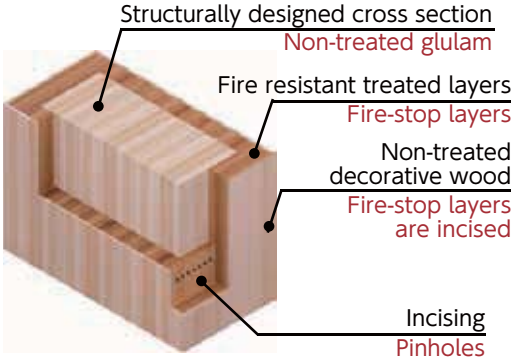
The gypsum covered type



The hybrid type



FR Wood® (Fire Resistant Wood)



Mid-to-High-Rise Wooden Buildings Have Become Possible

Up until now, we have secured the fire resistance by covering wood with non-combustible materials such as gypsum boards when we build wooden fire-resistant buildings. However, this posed a dilemma, “wood is invisible though it is wooden structure”.
To solve this problem, universities, institutes and companies jointly developed a new technology product “ FR Wood®”. With this technology, the fire won’t progress inside the load supporting parts (posts and beams), because they are surrounded by fire-stop layers which are injected with fire-retardant chemicals.

With its high fire-resistant performance, FR Wood® has enabled to build mid-to-high rise timber buildings even in cities. (Using FR Wood® inside the glass walls and others)

Flexible Design Made Possible

According to the conditions, you can design the cross sections freely from small to large. If the required size is larger than the smallest cross section size*, any cross sectional design is available, which will meet your needs more than before.

*The smallest size is 260mm x 290mm (load supporting part: 120mm x 120mm). As for the largest size, regulations are made according to the certificate.

Smooth Connection

To establish a fire-resistant building, the connections between fire-resistant floor, walls and ceilings are the key. As FR Wood® is a pure wooden component, joint parts and connecting parts can easily be assembled, which allows the construction the same as the one with conventional wood working.

As FR Wood® is pure wood, connection is smooth.

Flooring Applicable to Floor Heating

We have succeeded in materializing a flooring material, made of high quality solid cypress, applicable to hot-water floor heating (Korean 'ondol' system). We have worked on improving this product and achieved a linear shrinkage of 0.3 - 0.5mm (in average). This material can be used long time without degradation.

We can offer a stable supply of large amount of flooring materials which are applicable to floor heating, because we have materialized a huge production capacity by making good use of knotty cypress which had not been used as the material for interior finishing before. With our original technology, cypress twig pieces are embedded in the knots holes without space. So, this item can be used comfortably in the best condition keeping the beautiful figure of the fancy wood.
When the temperature of the water is set at 60 degrees centigrade, the temperature of the floor surface will be 30-34 degrees, which are comfortable for you. The moisture control function of solid wood is especially effective in damp rooms such as kitchens, undressing rooms, washrooms and bathrooms as well as in living rooms, child's rooms and corridors.

Our flooring material, 'Hinoki Butai' is popular in Korea by the name of "HINOKI ONDOL FLOORING" and used in many public facilities and houses.

Cedar Cut End Lumber with Slits

"Cedar cut end lumber with slits" is a product cut with slits (grooves) at intervals based on scientific data. By putting in the slits, the surface area of cut end is increased, and the design characteristics are improved. The product is processed by cutting horizontally across the tubular structure of the wood, and because the surface of the cut end is exposed, the purification and the humidity control functions that are originally found in cedar are brought out to their maximum. After the construction is completed, the fragrance of cedar is wafting in the air, and a refreshing feeling as if walking in a forest can be felt.

*The interval of the slits and the utilized surface area are manufactured based on data from experiments of the Research Institute of Environment, Agriculture and Fisheries, Osaka Prefecture.

Waiting room at a station

Taking in Impurities and Discharging Volatile Components

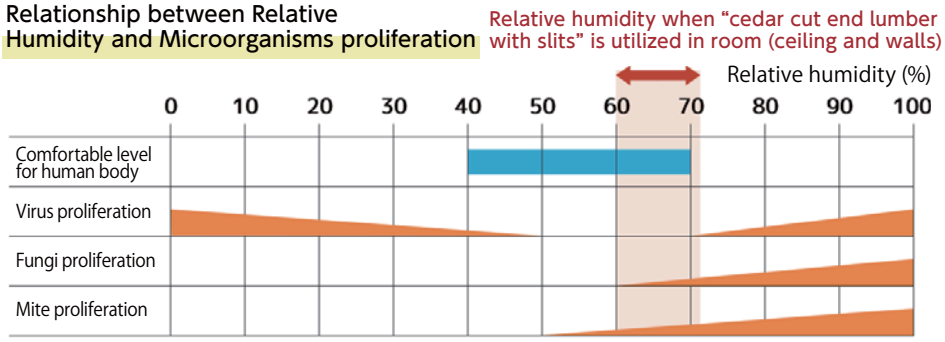
Compared to other tree species, cedar wood is known for its absorption of harmful gases such as nitrogen dioxide and formaldehyde in the air. This function was further improved with "cedar cut end lumber with slits". By exposing more of the cut end surface, the ability to absorb the harmful gases and to discharge volatile components is heightened. In the indoor space where the harmful substances are absorbed, the brain and body are vitalized, so the product plays a large role in the health of the mind and body. In addition, the volatile components discharged by the cedar wood have an effect of raising the immunity of a person, so the functionality concerning health also becomes extremely high.

Nursing room

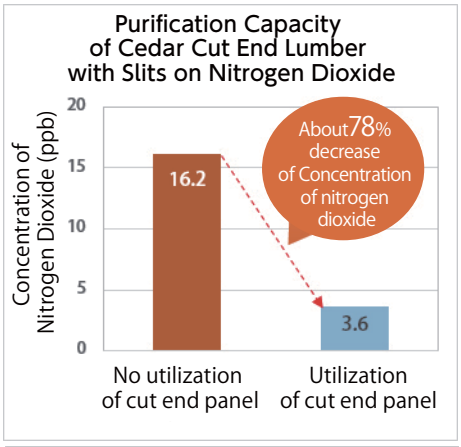
Kids'room

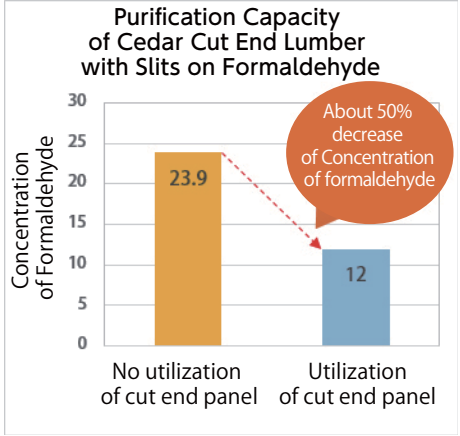
Making a Comfortable Indoor Space by Humidity Control Function

It has been learned that compared to general lumber, the "cedar cut end lumber with slits" has a high humidity control function that keeps the humidity constant inside a room. Due to this function, the proliferation of microorganisms such as fungi, mites, and viruses is prevented, and a comfortable indoor environment can be created.



Source: prepared from a study concerning "Interrelation of Relative Humidity and Microorganisms"of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and "Humidity Control Effect of Slit Cedar Lumber Constructed in Preserved Space"in *Summary of the Presentation of the Japan Wood Research Society*





Source: Summary of the Presentation of the Research Institute of Environment, Agriculture and Fisheries, Osaka Prefecture in Fiscal 2009 (Environmental Field)

Soothing the Mind and Body

According to the results of a study concerning the effects on a person of a living space, which utilized cedar wood, the space was found to be physiologically relaxing in comparison with an inorganic white painted room. This effect was found to be large especially in a room that utilized "cedar cut end lumber with slits" compared to general cedar boards (vertical grained lumber).

Natural Wood Veneer Sheet

Nowadays, natural wood finishing materials have been widespread through architectural designs and renovations for walls and ceilings. Some people believe that wood, as a natural material, is effective in mental relaxation as well as bringing out designs into outstanding and gorgeous spaces. Moreover, due to the improvement of wood processing technology, wood can be more than just wood. Wood is now a material that can be made creative, produced functional and formed flexible, fulfilling vital elements of architectural design for our better life.

Seoul Art Center1-Brazilian Koa

SAN JOSE AIRPORT

Suitable for curved surface

SanFoot® is a flexible sheet with a thickness of 0.35mm approx. that can be installed to curved walls and ceilings

Inflammable

Natural veneer sheets pressed with inflammable material that has passed fire test Class A in different countries.

Various wood species

Veneers of wide range wood species imported from all over the world for your best selection.

Flexibility

Allowing greater flexibility to all applications, SanFoot® can even be wrapped around columns without cracking.

Russia Reception

SanFoot® is a real wood veneer wallcovering with the natural beautifulness and certified inflammable quality, Therefore, it is suitable for all residential and commercial applications including performing arts, retails and hotel interiors. It has been proudly selected by many architects and designers.

Burnt Cedar Boards

Burnt cedar boards of which surfaces are burned and carbonized are Japanese traditional siding materials. Formerly, those walls were seen in houses of various statuses from samurai and aristocracy to commoners. And at present, they are still alive. They have become popular even outside Japan, because of their weather-resistance and durability, the unique blackish color, and the architectural design.

To improve the durability, we usually coat wood or inject it with chemicals, but burnt cedar boards are just burnt on the surface. As the surface is carbonized and protected, they are preservative even without coating, and their insect-resistance is high. They require no maintenance for a long time.

With the air layers, the weight of burnt cedar boards is light, which reduces the dead loads on the building frame, and improves the thermal insulation performance and the fire-resistance performance of the building. This item is a material for exterior walls with functionality and beauty.

According to the manufacturing techniques, there are various types of burnt cedar boards.

Charcoal Type

The texture of charcoal is beautiful. You can use it as exterior walls without maintenance for a long time.

Wood-grain Type

Finished so that the blackish late wood stands out.

Polished Type

Polished with a brush or cloths, the board is finished glossy.

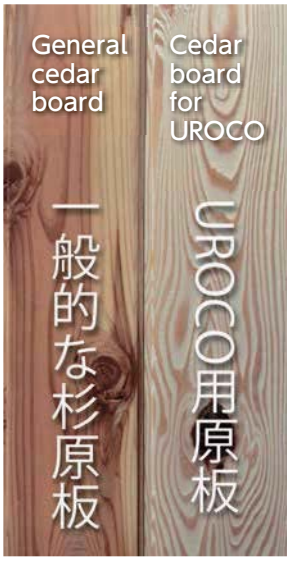
Burnt cedar boards are finished by brushing on the surface with special tools. Scrubbed on its soft parts, which grew in spring and summer, and left the hard parts, which grew in autumn and winter, the grain three-dimensionally stands out, with the carbonized black parts risen in a streaky pattern and the white parts sunken.

Colored Solid “Yakisugi (Charred Cedar)”

By processing cedar wood with a traditional technique and applying vivid colors while making the most of the natural grain, the product called “ Colored Solid Yakisugi UROCO” is made. A producing region of cedar is the Tenryu Forest along the Tenryu River system that maintains an abundant level of water. Because the pattern of the wood grain in winter looks very much like the squama of Tenryu (Heaven Dragon), the name “UROCO” was chosen. “UROCO” is made by charring and carbonizing the surface of a cedar board to make “ yakisugi”, which improves the fire resistance and durability, and the latest paint technology is applied. Also by polishing the surface, the parts other than the rigid winter wood grains are shaved off, so the roughness of the annual rings is beautifully revealed.

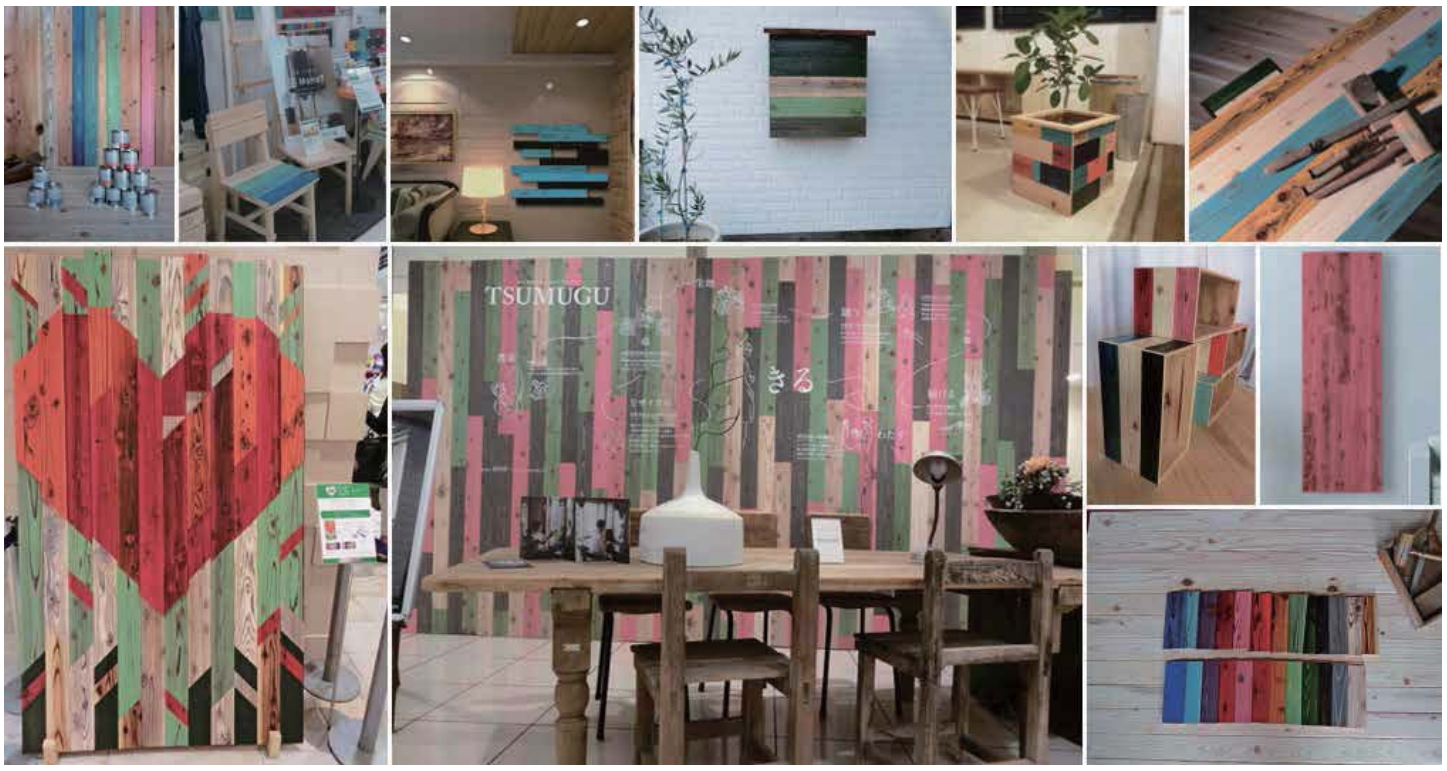
Can be made one board at a time sparing no time and effort

The boards to be processed are taken from the four boards sawed from the most outer part of Tenryu cedar trees that are 60 to 120 years old. Because many logs with an old age and a large diameter can be attained due to the nature of the land in Tenryu, high quality, boards can be used for UROCO. In addition, the quality of the color and wood grain depends not on machines but on the assessment of the craftsmen one board at a time. All the work including the processing and painting stages of the work is conducted manually.



Various Applications and Unlimited Possibilities Depending on Ingenuity

UROCO is a product finished with high quality and advanced design, and with cedar wood, it has designability and flexibility. Also because it has a large color variation, the possible applications are endless ranging from small wooden items to the interior of rooms.



Japanese Style Room and Tea Room

Amid a rapidly changing social environment, people today seek a peace of mind. In order to satisfy such needs, "Washitsu Gakyo (Japanese-style rooms or tea rooms)" is created under the concepts of "peace, serenity and healing". This product makes special space even in the residences such as condominiums. High-quality timber of Kitayama cedar from Kyoto and Yoshino cedar is used for the material. This is a highly flexible product based on Japanese style rooms which can be customized into various types of rooms to suit the customers' needs.

Possible to freely create various types of Japanese rooms

Creating Japanese healing space in a condominium room

Using Japanese high-quality timber (branded timber)

Designed to offer peace, serenity and healing

Japanese-style rooms are said to have originated approximately 1,200-1,300 years ago in the Nara period under the Buddhist culture. Typical Japanese style rooms are consist of a large space separated by "fusuma (sliding doors)". "Fusuma" can be easily removed, so, for example, an open space can be created by connecting rooms when you hold a "party", and by putting back "fusuma" in place, a room can be converted in small tea rooms when you have guests. Tsuchikabe (mud walls) is another feature of Japanese-style rooms. It absorbs moisture when humidity is high and releases moisture when it is dry, which make a comfortable living space. Thus, Japanese style rooms are sometimes said to be the most comfortable rooms in the world due to their fine features from both functional and formational perspectives. Today, mechanization has advanced and housing is at cutting edge, so the number of houses with all wood flooring increased. Japanese style rooms are valuable enough to be existed in such times.

Representative Wood in Japan

Healthy • Safety • Comfort

Sugi

Cryptomeria japonica

■ Softwood, conifer
■ Family: Cupressaceae

Sugi, along with Hinoki, is a representative tree species in Japan. As a coniferous tree unique to Japan, Sugi is widely popular and its applications are versatile. The origin of the name of Sugi is "immediately." A circular trunk stretched straight from the earth towards the sky: so it was given its name.

Sugi is a Japan's endemic species.

Cutting surface of Sugi

FEATURES:

The annual ring is clear and the difference in colors between heartwood and sapwood is also clear. Color of the heartwood ranges from peach to dark reddish brown and the preservative quality of the wood is moderate. The dry specific gravity ranges from 0.30 to 0.45, (0.38 on average) and it can be said that it is somewhat lightweight as Japanese coniferous trees. This becomes a big advantage when processing the wood. Sugi has a unique fragrance and you can feel it from buildings, interior decoration made from cedar wood, furniture, etc.

USAGE:

Sugi is widely used in Japan as building materials (pillars, beams, boards etc.), ceiling boards, polished logs, furniture, fittings, fixtures, packaging, barrels, high quality disposable chopsticks, shipbuilding, and more. In recent years, application for plywood and glued laminated timber has expanded. Aged natural Sugi used to make cabinetry and ceiling board, etc. of decoration purpose have high added value. Also, "polished log", which is a barked log polished with special sand, is used for alcove post, girder, interior, crafts,etc.

Treasures of Shosoin and Chinese chest of Sugi:

Shosoin is called "World's Repository", and treasures which were gathered from all over the continent through the Silk Road in the Nara era remain the of that time even after 1300 years passed. It is said that medicines and perfumes still retain their efficacy, without losing the vivid colors and shapes of the treasures. Its excellent preservation function is attributed to the "Chinese chest made of Sugi", in which the precious contents were preserved.

素木唐櫃雛型 正倉院模造
Photo：Research Information Archives, Tokyo National Museum

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.38	0.1	0.25	64	34	5.9	7.4

Hinoki

Chamaecyparis obtusa

■ Softwood, conifer
■ Family: Cupressaceae

Hinoki, as much as Sugi, is a representative tree species in Japan.
Hinoki is durable and has a characteristic fragrance. It has second largest plantation areas next to Sugi, and is widely used as high-grade lumber. "Nihon Shoki" which is the Japan's first authoritative history says "build a boat with Sugi or camphor tree, build a palace with Hinoki and make a coffin with podocarpus". Hinoki has long been known to be the perfect and best material for palace construction. As for the name of Hinoki, taking the " sun" which represents the highest precious thing, there is the theory "Sun's tree".

The name of Hinoki as "Sun's tree

Cutting surface of Hinoki

FEATURES:

The color of the heartwood is pink and the sapwood is almost white. Along with its characteristic fragrance, it has a sense of cleanliness and is highly durable. Durability of the heartwood is particularly high, and it withstands water moisture for a long time. The dry specific gravity ranges from 0.30 to 0.45, (0.38 in average). The annual ring is not very clear, as the change of the cell shape in one year is small. Therefore, Hinoki is a homogeneous and dense species, and its surface would be beautiful and glossy if finishing is made well.
The name,of Hinoki is also said to be derived from "fire tree" connoting that it was used for fire-making.
It is said that Hinoki is hard to cause deviation as a material because it can dry so well deep inside that it can make fire.

USAGE:

Because of its excellent properties, Hinoki is used for many purposes as a high grade material. When you call a house of Hinoki , it is used as a synonym for a high class house. Hinoki is imperative for building temples, shrines and palaces. Also known are fittings, sculptures (such as Buddhist statues) wooden shapes, curves, troughs, separators for storage batteries, and so on. "Hinoki bath" is a way of utilizing the durability of Hinoki

Hinoki Bathtub

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.44	0.12	0.23	74	39	7.4	8.8

Karamatsu

Larix kaempferi

■ Deciduous conifers
■ Family: Pinaceae

It has the origin of the name that it resembles a pine of Tang painting (Chinese painting). Because it is the only deciduous tree among Japanese coniferous trees, it sometimes is written as "deciduous pine".
Tree forms are beautiful, leaves turns golden in autumn, and the trees color the autumn scenery beautifully. Leaves drop in the late autumn. Despite the beautiful shape and the soft image of the tree, the larch lumber is rather heavy.

Karamatsu that turns yellow in autumn

Cutting surface of Karamatsu

FEATURES:

The color of heartwood is bronze. Although it is relatively pale when the tree is young, it gets darker as the tree matures. Sapwood is yellowish white. The substantial difference in shapes of cells formed from spring to summer results in clearly understandable annual rings, thus the texture is rough.
Specific gravity in air-dry ranges from 0.40 to 0.60, (0.50 in average), being one of heavy-duty softwood lumbers. Natural Karamatsu which grow older and slower is called "Ten-Kara", and it is highly evaluated in contrast to young trees planted and it is traded at a high price as a precious wood. Heartwood has moderate preservatory quality.

USAGE:

Karamatsu is a durable species that is used as a utility pole or pile. It used to be that it is difficult to use it as a sawmill, but due to recent progress in utilizing and wood processing technologies, etc., products that make use of the strength of the lumber have become available and are actively used.

Karamatsu is used for building, public work, dunnage, pallet, furniture, and packing. Karamatsu plywood have been increasing recently. In addition, Karamatsu is resistant to decay and has moderate elasticity, so it is also used for guardrails and the like.

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.50	0.18	0.28	78	44	7.8	9.8

Hiba

Thujopsis dolabrata

■ Softwood
■ Family: Cupressaceae

Another name for Hiba is "Asunaro". Its origin derived from "It will become Hinoki tomorrow," implying an image of its inferiority to Hinoki. However, due to the unique fragrance of Hiba (hinokitiol), it has durability so that it will not spoil to the core even if it dies. For that reason, Hiba is by no means of inferior species to Hinoki.

Aomori Hiba, one of the three most beautiful forests in Japan

Cutting surface of Hiba

FEATURES:

Characteristics of this kind of wood can be easily distinguished from others because of its unique fragrance. It is also highly durable and resistant to water and moisture, so it is often used for such as sill. As in Chusonji Temple in Hiraizumi, where there were no good Hinoki in the surroundings, it is known that Hiba had been often used for buildings such as temples. Specific gravity in air-dry ranges from 0.37 to 0.55 (0.45 in average).
Because of its toughness and durability, there is a demand as sills in wooden houses, even outside the growing area. Not a small number of houses use posts of Hiba. As the color of heartwood is pale yellow and the sapwood is yellowish white, the difference in color is little. There are not much differences in shapes of the cells within the annual ring, and the texture of the surface is fine.

USAGE:

Hiba is mainly used for building. In particular, sills and joist of Hiba are popular. Others are tools, bathtub and lacquerware base (Wajima graining in the Noto district), etc. for its preservative quality and strength.

Hiba Bathtub

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.45	0.19	0.27	74	39	7.4	8.8

Abies Sachalinensis Todomatsu

■ Softwood
■ Family: Pinaceae

Although Todomatsu has "Pine" in its name, it is not a Pinus genus but a fellow of Fir and is the same family of Firima (A. frima) or Shirabe (A. veitchii) seen in Honshu. The distribution of Todomatsu is limited to Hokkaidoincluding the Minami Chishima and Karafuto Islands. Todomatsu is collectively called Ezo Todo, together with Ezomatsu which are the representative tree species of Hokkaido.

Forestry of Todomatsu

Cutting surface of Todomatsu

FEATURES:

There is not much difference in color between the heartwood and the sapwood, being almost white altogether. Its cutting surface is light and gentle. The wood is relatively light and soft in whitish color. Because of that, the thermal conductivity will be low, so you can feel a little warmth when you touch it. The transition from early wood to late wood is so quick that the annual rings are clear. Specific gravity in air-dry ranges from 0.35 to 0.52 (0.44 in average) as it is slightly lightweight. The material is easy to split, cut and dry.

USAGE:

In Japan, it has been widely used as a building material in Hokkaido for a long time, siding boards, ceiling boards, floorings and sheathing boards as well as structural member such as columns and beams. It is preferred and used in Hokkaido just like Sugi in Honshu, Shikoku, and Kyushu. It is also used for pulping materials, packaging materials, disposable chopsticks, cutting boards and so on. It is also used as public work materials because it is relatively resistant to decay. It is sometimes planted around a house as a windbreak, which creates a unique landscape in Hokkaido.

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.40	0.14	0.35	64	32	6.4	7.8

Ezomatsu

Picea Jezoensis

■ Softwood
■ Family: Pinaceae

In Japan, this species distributed in Hokkaido is called "Ezomatsu" including acacia pine which is closely related. It is distributed in commerce as "Ezo Todo" together with Todomatsu. Durability of this wood is high and this is a useful species in a cold district. It is designated as "tree of Hokkaido."

Forest of Aka Ezomatsu

Cutting surface of Ezomatsu

FEATURES:

There may be not much difference in color between the heartwood and the sapwood, but the heartwood is in pink and it has fine texture. With the time after cutting, the color becomes darker. The wood grain goes straight and is beautiful, and it is often used for building materials. There is also a characteristic of having almost no smell. Although it has an axially intercellular canal (resin canal), "resinous exudate" does not much seep out on the material surface.

USAGE:

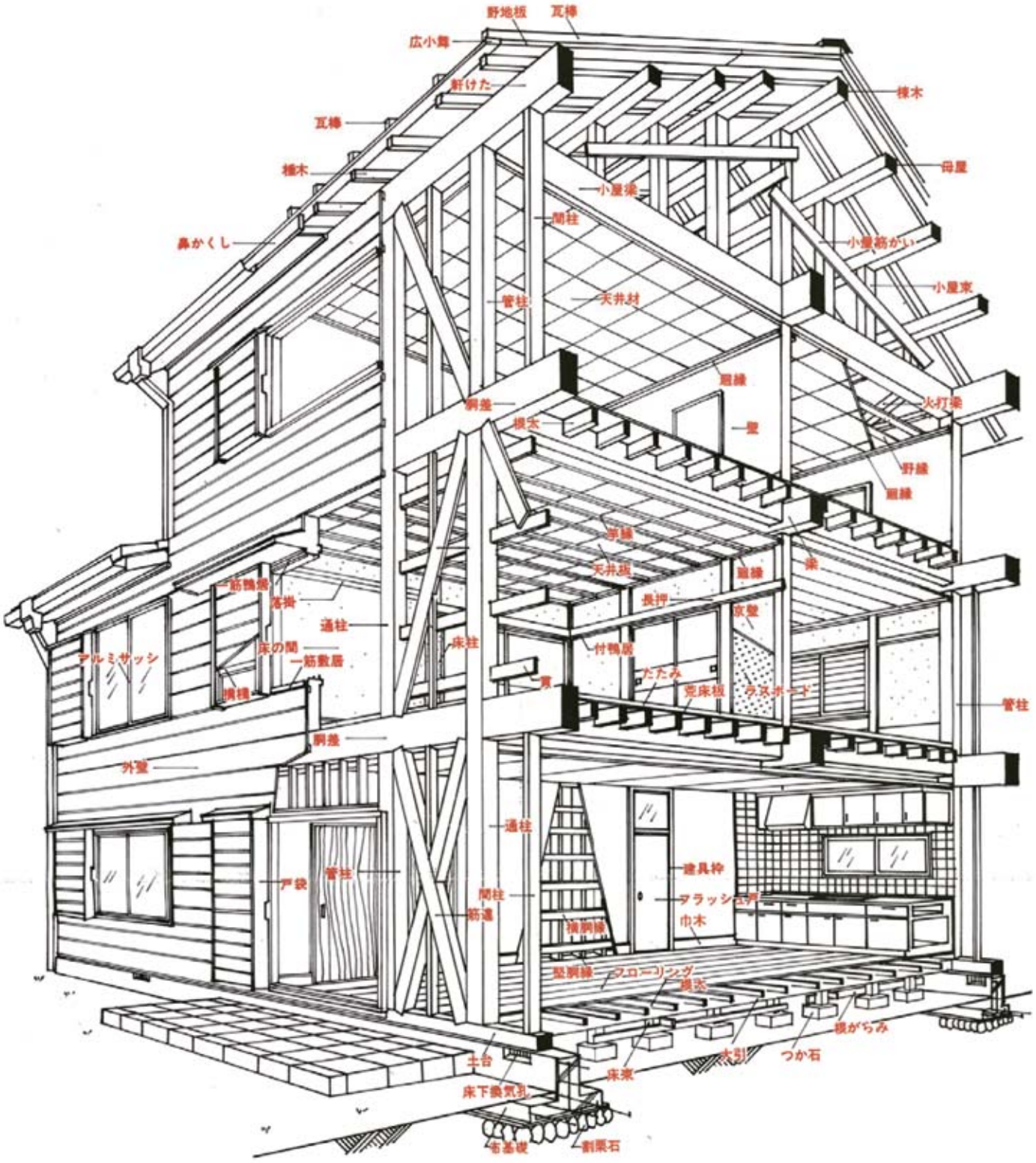
The species is used as building materials, fittings, pulp, wood wool, paper - thin sheets of wood and even for musical instruments. Houses in Hokkaido are built using Ezomatsu and Todomatsu, which is very common in Hokkaido. In addition, because the acoustic characteristics fits well with instruments, the lumber is used for violin, piano and other instruments. It also becomes pulp material used for the cone of the speaker. In addition to afforestation, it is planted as windbreak forest, park tree, or garden tree.

Charactristic Table

Specific gravity in air-dry	Mean coefficient of shrinkage for 1% change of moisture content (%)		Strength (Mpa)			Modulus of elasticity in bending (GPa)
	Radial direction	Tangential direction	Bending strength	Longitudinal compressive strength	Shear strength parallel to grain	
0.43	0.15	0.29	69	34	6.9	8.8

Japanese Post and Beam Construction

Japanese post and beam construction is the most popular structural system among the timber buildings in Japan and originated from the traditional timber building technique. The main frames are sills, posts, beams and girders. Let-in-corner braces are the member to resist to horizontal loads such as wind and seismic loads. Recently, plywood is beginning to be used instead of braces. In general, Japanese post and beam construction has more flexibility of structural and architectural design than the other structural systems. Room layout, big openings and wood surfaces to show in the room are the examples. In the past, a skilled-craft work was essential to cut the structural members including the caved connection parts, which required several months before the construction. But now, lumber is precut in factories by using so-called " Precutting systems" with CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing), which has shortened the total production period of buildings. The connections are reinforced by using metal plates, bolts and screws.
With various measures like them, we are trying to shorten the construction period, increase the durability, and improve the seismic resistance.



Source：Forest Material Newspaper Co., Ltd.（Rinzai Shinbun）

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■Water vapor high temperature heat-treated lumber (ThermoWood)
■Advanced preserved resin treated wood (Wood deck)
■Plywood for antiseptic and anti-termite structure

KOSHII&CO.,LTD
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http://www.koshii.co.jp
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TEL：+86-21-6236-2661 FAX：+86-21-6236-2661
http://www.jpkoshiiwoods.com

■Nitriding-heat treated wood (S-TECH　WOOD)
Echo-life Operation Division, Emachu Mokuzai Co., Ltd.
3-3-3 Harumi, Chuo-ku, Tokyo, Japan
TEL：03-3533-8211 FAX：03-3533-8219
http://www.st-wood.jp

■Thick Structual Plywood (Nedanon)
Japan Plywood Manufacturers' Association
2-21-2 2 Misaki-cho, Chiyoda-ku, Tokyo, 101-0061, Japan
TEL：+81-3-5226-6677 FAX：+81-3-5226-6678
http://www.jpma.jp

■Laminated veneer (LVL)
National LVL Association
8th Fl., Shin-Kiba Tower, Koto-ku, Tokyo, Japan
Building Construction Management Division,
KAJIMA CORPORATION
6-5-11 Akasaka, Minato-ku, Tokyo, Japan
TEL：+81-3-5544-0229
https://www.kajima.co.jp

■Flooring materials for floor heating (Yukadan Hinoki-butai)
Ikemi Inc.
Head Office, Factory: 1-3-48 Sakanoichi-Chuo, Oita, Oita, 870-0307, Japan
TEL：097-592-2122 FAX：097-593-2713
http://www.ikemi.co.jp

■Sugislit (Cedarwood)
Osaka Federation of Wood-industry
3-6-9 Shinmachi, Nishi-ku, Osaka, 550-0013, Japan
TEL：06-6538-7524
http://www.mokuzai.or.jp

■Sheets made from real natural veneer (Sanfoot)
Sanfoot Overseas Division,
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1-7-6,Shinkiba,Koto-ku,Tokyo,136-0082 JAPAN
TEL：+81-33521-2111　FAX:+81-33521-6644
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■Colored solid Yaki-sugi (UROCO)
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Supported by Forestry Agency, October 2017