

## Wood is Present for all Humanity with Its Unique Existence

**Ilker USTA**  
Hacettepe University

**Abstract:** Wood, which is the single most renewable natural material known to humans in due course of the sustainable forestry efforts, and that provides numerous benefits for all people since the beginning of recorded history with its anatomical structure, chemical composition, physical properties and mechanical properties, has the characteristics and features, all of which are construed as marvelous or miraculous in some way, in terms of meeting the needs and requirements arising in everyday life. Wood also stands out as an entity that has a positive effect on people's emotions, thoughts, attitudes and behaviors throughout history. Because wood is also known for providing communication, which is an exchange of information between two or more people belonging to different cultures, and/or among generations in the same culture, that is at the heart of human interaction, almost everyone agrees that wood is important and valuable as a material and an entity in the context of the development of civilization and humanity. In this article, therefore, depictions are made about the internality of wood, which is present for all humanity with its unique existence. This textual depictions are prepared with a woodlover point of view to exemplify the versatility and functionality of wood, which has been in use worldwide for thousands of years with a broad range of products or applications either alone or in combination with other materials in terms of the various purposes to live a perfectly happy and comfortable life.

**Keywords:** Wood, Intercultural interaction, Woodlover approach, Material properties of wood, Humanity

### Introduction

It is certain that wood is a material with a deep-rooted history that is used in the same or very similar way in all cultures from past to present. Part of that is because wood is available in large quantities from sustainable forests, and it is also because wood is easily processable in a variety of different forms in order to produce something for a particular purpose. Although many researches have shown that wood is an important natural material and a valuable entity in terms of its distinctive properties, numerous issues still need to be addressed on the broader concept of the flexibility and usability of wood, with a need for providing more assessments of its versatility and functionality accompanied by innovation and creativity, which are still sorely lacking in order to make wood more approachable for solving a problem as alone or as a complementary material along with other components. Therefore, in this article explanatory descriptions are made about how wood has internality in terms of its characteristics and features as a material that provides countless benefits to people and as an entity that positively affects people. In this perspective, wood is depicted in the context of its great contribution to the development and spread of civilization and the advancement of humanity.

### The Unique Existence of Wood

In a more general context, the eventual existency and uniqueness of wood can be considered with its tangible and intangible properties on the basis of its characteristics and features that make life easier and more convenient in many aspects. At this point, it is certain that the material properties of wood (based upon its anatomical structure, chemical composition, physical properties, and mechanical properties) are the subject of many researches as a vast subject which is studied from a very wide perspective. For that reason, the study of wood as a natural and an organic material and many of the issues faced in the professional activities related to wood have been treated with all the appropriate details in various specialized texts and reference works (e.g., Tiemann, 1944· Esau, 1953· Armstrong, 1955· LIFE Magazine, 1959· Stamm, 1964· Kollmann & Cote, 1968·

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- Selection and peer-review under responsibility of the Organizing Committee of the Conference

Berkel, 1970· Siau, 1971· Skaar, 1972· Nicholas, 1973· Hoadley, 1980· Panshin & de Zeeuw, 1980· Zobel & van Bujitenen, 1980· Bodig & Jayne, 1982· Wilson & White, 1986· Bozkurt & Göker, 1987· Barnett, 1988· Fengel & Wegener, 1989· Tsoumis, 1991· Bozkurt, 1992· Eaton & Hale, 1993· Sjöström, 1993· Dinwoodie, 2000· Rice, Kozak, Meitner, & Cohen, 2006· Forest Products Laboratory, 2010· Shmulsky & Jones, 2011). And, of course, the studies, which focus on wood, have revealed that there is no doubt that wood, as a natural and organic material, has an almost limitless internality that provides great benefits to all people in the world. For example, as one of these studies aiming to shed light on the place of wood in our lives and its role in the development of civilization, the importance of wood as a material and its value as an entity has been explained extensively in a diverse themes in various publications by Usta in national or international journals or congresses between 2014 and 2018 in view of its properties that make life easier and definitely better in many ways for various reasons. As the characteristics and features available in wood have always been considered a core subject of many studies performed with either general or more specific severity and priority criteria in the field of wood science and technology and other related areas, the unique existence of wood can be clearly stated and explained from different angles and points of view by a high number of thematic titles. Accordingly, wood has been depicted by Usta (2014, 2015, 2016, 2017, 2018) in accordance with the studies of the different and common aspects of wood as a material and an entity, and the possible assumptions and intellectual approaches regarding the provision of individualized support for both learning and teaching wood as well as building social awareness have consistently been fictionalised throughout almost all his depictions. In fact, his writings about wood might be quite impressive, because this writings are steeped with a sense of identifying the acceptable views and describing absolute reality on the basis of examining a particular set of issues that what way can the studies of wood contribute to our understanding of communication, interaction, culture, and civilization.

It is a long established fact that wood is an irreplaceable material and a magical entity in the development of civilization and the advancement of humanity, because it is a renewable natural material obtained from trees as a reflection of nature with the means of the sustainability efforts, and it is also an extraordinary tool in intercultural interaction throughout all stages of societal development forming the continuous advancement of humanity. Although it has certain names in every language with respect to cultural differences and lifestyles, wood is a universal material and has served all people throughout history with an almost limitless variety and has provided tremendous benefits to everyone. Surely wood has always been an indispensable material and a remarkable entity in the history of civilization regarding with its superior characteristics and fabulous features that are naturally occurring on the basis of its anatomical structure and chemical composition, and physical properties and mechanical properties. At this point, it can be clearly said that wood is present for all humanity with its unique existence due to its versatility and functionality in the sense of flexibility and usefulness since the beginning of mankind. In this context, because wood is a wondrous material to meet the different needs and requirements of people and is an outstanding entity of the world that affects people's feelings and thoughts, it is one of the most widespread and potentially generative resources on earth that can be adapted in several applications and turned into various types of products to facilitate mundane activities of daily life.

### **Characteristics and Features of Wood**

The most fascinating truth is that wood is a versatile and functional material that can be used in many different ways for a variety of purposes based solely upon its characteristics and features that each of them has a separate definition from the other. This concept and the terms "characteristics" and "features" have been described in detail previously by scientists. Although the characteristics and features of wood, as two distinct phenomena that could be featured by a variety of contexts, are a technical issue in the field of wood science and technology evaluated by numerical values based on experimental findings, they are generally explicable in terms of understanding of wood by everyone. To put it briefly, these two phenomena have completely different meanings: a) the characteristic is the key distinguishing trait of wood, and can vary within and between tree species, and hence this means that anatomical structure and chemical composition of wood are subjected to identical formations with the characteristics of trees which provide us wood as a natural and organic material, and b) the feature on the other hand is the most closely related transformation that occurs depending on the typical characteristics of wood, and thus both the physical and mechanical properties of wood are the features represented dependently on the characteristics in terms of the anatomical structure and chemical composition of wood. In a wide sense, the characteristics of wood concerning the anatomical structure and chemical composition are souls of all features in wood with regard to the physical properties and mechanical properties.

Wood is a natural material harvested from trees grown in the sustainable forests, and it is an organic material with having hygroscopic behaviour and also heterogeneous and anisotropic attributes that allow us to widely acknowledge that it is a living asset with a genuine instinctive effort. In this circumstance, wood, which is a

natural and organic material, is perhaps the most obvious example of fibrous and porous materials that have expressed botanically as a function of its cellular nature. In this context, according to the microscopic observations and the findings of the experimental studies which are previously described what it refers to be technical and vocational means in literature, wood has the fibrous and porous structure anatomically consisting with the three-layered cell wall (which is constructed with the microfibrils oriented at various angles to the longitudinal direction) and the lumen, and the cells are composed of cellulose, hemicellulose, lignin, and a small amount of extractives (that are extraneous materials containing several types of inclusions deposited in wood in due course of growing a tree). Besides, the anatomical structure of wood is shaped by the growth rate of the tree from which wood is taken, which varies from species to species throughout in either softwoods (needle-leaf trees, or conifers) or hardwoods (broad-leaf trees, or broadleaves), emerges with the growth ring formation based upon the growth ring width and also the proportions of earlywood (springwood) and latewood (summerwood) per unit length within annual growth rings. Likewise, the chemical composition of wood is also based on the structural organization of cell wall, and therefore it appears a reflection of the cell structure of wood. In that sense, the chemical composition of wood varies from one species to another, but it mainly consists of carbon, oxygen, hydrogen, nitrogen, and other elements (in terms of the components assimilated by the tree from which wood is obtained according to the conditions in the growing environment) by weight.

As we may surmise from the paragraph above, wood has many different features in terms of the physical and mechanical properties, each of which can be evaluated separately. In this frame, the physical properties of wood are those that influence its capacity of utilization as a raw material for making products for different purposes in a wide range of needs and requirements. The prominent topics adjacent to the features with a lot of specialist terminology related to the physical properties of wood could be listed predominantly as follows: a) density (used here synonymously with specific gravity), value of unit weight (also known as the green weight), porosity (the certain amount of void volume), b) hygroscopicity, absorbability in accordance with adsorption and desorption, moisture content, fibre saturation point, swelling and shrinkage, c) diffusion, surface tension and capillarity, drying, permeability, amenability to preservative treatment, d) specific heat, e) thermal properties on the basis of thermal conductivity, thermal diffusivity, thermal expansion, and thermal insulation, f) electrical properties in terms of electrical resistivity and electrical conductivity, g) acoustical properties based on the sound conduction, sound absorption, and sound dampening, h) adhesion properties as related to gluability and surface finishing. Wood of course, is composed of cells, has the mechanical properties that are measures of its resistance to the action of the exterior forces which tend to make a deformation at a given rate. The ones that are the most important mechanical properties of wood well known for a wide variety of applications are as follows: a) elasticity, strength in bending, modulus of elasticity (MOE), modulus of rupture (MOR), b) strength in tension, strength in compression, c) strength in shear, d) torsional strength, e) cleavage, f) nail and screw holding power, g) hardness, toughness, h) wear resistance.

In considering the capillary system of wood consisting of the cell walls and the cell lumina, it is clearly seen that the cell structure influences both physical and mechanical properties of wood, and this leads us to the understanding that the features are depended on the characteristics. On the other hand, both of the physical and mechanical properties have direct or indirect effects on the use of wood for various purposes referring to density and moisture relations that affect the choice of wood for manufacturing of goods and items ordered within the general or special reasons, whether or not material is procured from either coniferous or broadleaved trees. In both cases, since wood is a fibrous and porous material, the physical and mechanical properties of wood are primarily shaped by specific gravity (or usually referred to as density) which is the net amount of wood per unit volume (that is to say the actual quantity of wood available in the cell wall in the unit volume), and are defined by the amount of moisture retained within the cell cavities of wood and also in intermicellar and intermicrofibrillar spaces in the cell wall. In the light of these explanations, considering the conspicuous differences in the qualities and attributes of wood material, physical properties and mechanical properties are mainly correlated with density and moisture content. In view of the moisture content, which can be thought of as the amount of water within the all possible cell voids of wood, the presence of excessive or of deficient moisture in wood can adversely affects the internal consistency and dimensional stability of wood material and thus its quality and usability. Therefore, understanding the correct moisture content of wood as well as maintaining it by accurately providing the acceptable level of moisture using different methods of drying prior to use, is absolutely essential to ensure the material quality of wood in terms of both physical and mechanical properties.

#### *Tangible and Intangible Assets of Wood*

It is pretty obvious to us that wood, which is the most beautiful and creative material in the world because of its unlimited availability providing a vast array of unsurpassed offerings for the production of products in many

different ways in different contexts for different purposes, is by far the most famous material around the world since the ancient times with its positive and motivational qualities. Correspondingly, it is no doubt that we can clearly visualize a wide variety of such offerings of wood with an impressive array of products available in many categories that are ideally suited to meet the needs and requirements of people in almost all parts of the world. It should further be noted that we can envisage the part of the activities of organic lifestyle that rests upon the reasonableness and part of the contemporary experiences of the mere fact of living a more natural life combining a reasonably diverse set of potential applications of wood that has existed for centuries in other cultures, and other customary conditions consisting solely of environmentally friendly materials that can be recycled relatively easily without any loss of utility. By far the most important concept on this depiction is understanding the availability of wood as a natural material and a valuable entity. At this point, it may be able to say that the most inspirational and powerful things in life to live a passionate and purposeful life is that the consciousness, which is an awareness or perception of something, is the only reality. In this respect, because wood is the most applicable material in a wide variety of applications by means of a broad range of products in the context of different purposes, it is worth acknowledging that the only reality is wood.

It is evidently true that wood, as a natural material and a valuable entity, has tangible and intangible assets in a form that these are evaluated as the most impressive and attractive properties of wood at first glance along with its characteristics and features in some situations. In this case, tangible attributes of wood are those properties capable of being handled or touched and may be evaluated by the senses, whereas intangible properties of wood may be evidenced by its intrinsic value according to the possibilities of satisfying expectations and the range of individual or social benefits from actively engaging with multiple point of views. Indeed, wood has the various perceptible attributes that can be easily perceived by the senses or grasped by the mind to be capable of being handled or touched or felt based on the appearance and weight as well as the usage functions of wood such as colour, luster, odour, and texture. Besides, wood, which is a good-natured and affable entity showing friendly warmth, is a natural material that appeals to the senses and emotions. Accordingly, wood is valuable material that directly or indirectly affects people's attitudes and behaviors and feelings and thoughts in a positive way and allows people to feel good at all times. It is true, therefore, that in the context of the tangible and intangible assets of wood based on the whole range of its characteristics and features, in terms of the process of socialization as well as the functioning or flourishing civilization, wood provides a wide range of interactions and relationships between societies in different cultures, and also among individuals within the same culture.

## **Conclusion**

Wood is a material that has played a major role in the development of civilization and the advancement of humanity by using widely in order to meet the needs and fulfill the requirements with its superior material properties, and has witnessed the flow of history from the beginning of time to the present.

In this context, in this article, the unique existence of wood is depicted based on the fact that wood is an important material and valuable entity that has provided countless benefits for humanity throughout history with its both typical properties and specific assets either tangible or intangible. Obviously, wood is such an important and valuable natural material that it is the most prominent representative of sustainability because of its renewability, and also it is a symbolic figure of creativity and innovation since it is used in many different ways for almost limitless purposes. It is absolutely true that wood has always been by our side with its natural warmth and versatility since the beginning of history and did not leave us alone in fulfilling the needs and requirements of life, and is never ordinary with its many advantages and numerous benefits for everyone. However, although wood is always standing beside us, we may deem its contributions to us to be insignificant. But most importantly, if we could change the way we see it, we can see the ways to benefit from wood more efficiently and effectively. In other words, at this point it is up to us for widening the use of wood in different ways by thinking in a certain way to find out reasonable solutions for our needs and requirements present in every area of our lives. Typically, wood has always offers us an utterly bewildering array of possibilities and opportunities for our choices, and so we love wood with a deep passion and the full array of feelings and thoughts. It is quite clear that as the challenges that we face everyday should be solved in an acceptable way, wood leads us to overcome obstacles in our life by providing us many useful everyday items. In this situation, we should find out the most suitable options to ensure the implementation of wood using with the whole range of experiences and knowledge as well as consistency between the various activities that are linked by the mundane tasks of daily life. For this, we need to think broadly and consider other people's thoughts about wood with great care and sincerity. At this point, given the great contribution of wood to the development and spread of civilization as an intercultural interaction tool, the common or similar views of people of different cultures about wood are confirmation of the universality and uniqueness of wood. Certainly, the living conditions in which we aware

explain in part why people from different cultures are more predictive for diverse lifestyles in terms of using wood to make a wide variety of desired goods and services for fulfilling the needs and requirements in relation to the mundane daily activities. In these circumstances, it is perfectly true that wood deserves to be applauded at least once in our lives thanks to its naturality and renewability, and its versatility and functionality.

This article contains original depictions of Professor Ilker Usta with the emphasis of “Wood is Present for all Humanity with its Unique Existence” that have been made within the course “Importance of Wood in Intercultural Interaction”, which is a new elective course for students of Hacettepe University (Ankara, Turkey) designed in 2013 when updating the curriculum of Wood Products Industrial Engineering due to the scope of the Bologna Process and launched under the Elective Courses Coordination Unit within the responsibility of the School of Vocational Technology, in terms of raising awareness about wood by introducing its importance in the development of civilization as well as its role in improving the quality of life to the university students studying in programs apart from the field of wood science and technology. In this context, the containments forming for these depictions written in terms of the woodlover point of view are internalized with professional and/or technical knowledge, and although the sources that are taken into consideration for fulfillment the particular theoretical explanations to strengthen wood awareness or for writing the general descriptions to introduce wood efficiently are shown in the reference list, comprehensive knowledge about wood can be elaborated in greater detail elsewhere in the literature.

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### **Author Information**

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**Ilker Usta**

Hacettepe University  
School of Vocational Technology  
Department of Wood Products Industrial Engineering  
06532 Beytepe Campus  
Ankara / Turkey  
Contact E-mail: [iusta@hacettepe.edu.tr](mailto:iusta@hacettepe.edu.tr)

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