

The Environmental Information System acronymed as ENVIS was implemented by the Ministry of Environment & Forests by end of 6th Five Year Plan as a Plan Scheme for environmental information collection, collation, storage, retrieval and dissemination to policy planners, decision makers, scientists and environmentalists, researchers, academicians and other stakeholders.

The Ministry of Environment and Forests has identified Consumer Education and Research Centre (CERC), Ahmedabad, as one of the centers to collect and disseminate information on "Eco-labelling and Promotion of Eco-friendly Products". The main objective of this ENVIS Centre is to disseminate information on Eco products, International, and National Eco labeling programs.

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Wood and its Substitutes

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Foreword

With each passing year, the harvesting of conventional hardwood trees for commercial purposes has become costly day-by-day. Restrictions by Ministry of Environment and Forest and their stringent guidelines, over development in areas once rich with high grade commercial timbers and other factors have forced industry to look for a suitable substitute.



To promote the responsible use of wood as an environment friendly raw material, forest department of government across the world is taking interest. There are many certifying agencies certify wood industries' responsible management practices. These certifying agencies process throughout the entire forest supply chain to promote good practice in the forest and to ensure that timber and non-timber forest products are produced by good management practices with respect for the ecological, social, and ethical standards. These labels ensure consumers that these products are from sustainably managed forests when buying furniture, paper, and other wood-based products. Eco labels allow consumers to make informed choices and industries to get access to the global market.

Since last few years, wood and wood based products are facing competition from materials like plastics, steel, glass, or aluminium. These materials offer ample options to the consumers and are the most readily recyclable. But while manufacturing and recycling of these requires petroleum, a non-renewable resource. While disposing these materials, there is an environmental impact. Consumers are concerned about the environmental consequences. Wood and wood substitutes have positive impact on environment. These are not only renewable and recyclable but can also become a source of renewable energy. Wood substitutes are usually made from agricultural wastes like sugarcane bagasse, rice husk, other crop residues, and cotton stalk or from wood that cannot be used as timber, like twigs and small branches. Now furniture manufacturers are using these substitutes for manufacturing furniture. Utilisation of these wood products from well-managed forest can contribute in accomplishing sustainable development. These engineered wood - free; wood-substitutes will reduce the consumption of precious wood and the destruction of the fast deleting forests of our country.

Wood and Environment

Wood can be defined as hard, fibrous substance composing most of the stem and branches of a tree or shrub, and lying beneath the bark. Wood is a renewable material and multipurpose raw material. It can be used for construction, furnishing, furniture, food handling, packaging, pallets, and transport applications including fuel. The total area of the land covered by the forest is decreasing day by day. The increasing demand for wood leads to deforestation. According to the India State of Forest Report, 2011, released by the Forest Survey of India (FSI), the total forest cover in the country is now at 6,92,027 sq. km. This accounts for 21.05% of the total geographical area of India. In comparison to the 2009 assessment, after taking into account the interpretational changes, there is a decrease of 367 sq. km in country's forest cover.

However, Indian forests have suffered serious depletion over the years. This is because of persistent pressures arising from ever increasing demand for fuel-wood, fodder and timber; inadequacy of protection measures; diversion of forestlands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource. So forest conservation has become imperative. Conservation includes preservation, maintenance, sustainable utilisation, restoration, and enhancement of the natural environment. The Ministry of Environment & Forest has reviewed and revised the National Forest Policy. The primary objective of Forest Policy is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium, which are vital for sustenance of all life forms, human, animal, and plant. The objective of the forest policy is to encourage efficient utilisation of forest produce and maximising substitution of wood.

Bhopal based Council of Scientific and Industrial Research (CSIR)-Advanced Materials and Processes Research Institute (AMPRI) has defined the wood substitute as industrial wastes like redmud, flyash, jarosite, marble slurry dust, copper tailings, and

natural fibres like sisal and jute and used as fillers for developing a variety of polymer composites. These recycling waste products are one way that helps in reducing the carbon footprint and reduce the need for deforestation. The material used for wood substitutes should be recyclable, reusable, or biodegradable. It contributes to sustainability. So wood or a wood-based product can be used as a carbon-neutral source of energy.



Conventional methods of cutting down of woods create problems of erosion, destruction of natural habitats and biodiversity, reduction in oxygen generation, and poor quality of air and water. It creates such situation not only in its neighbourhood but also at a global scale. One way to reduce the use of wood would be to meet the demand with other materials. Because wood makes up such a huge proportion of the raw materials we use today, this would substantially increase demand for its substitutes and alternatives that have a less impact on the environment.

Certified Wood

Certification programmes assure for green forestry. Certification of wood and its products display that these are from responsibly managed forests as defined by a particular standard with third-party forest certification. These standards are developed by an independent organization for good forest management. Independent auditors issue certificates to forest operations that comply with these standards. Certification is a way to use the market to provide positive incentives for long-term, ecological, forest management and ensures consumers that products come from responsibly managed forests. The major international forest certification programmes are:

The Forest Stewardship Council (FSC) is an international not for-profit, multi-stakeholder organisation established in 1993. It sets standards on sustainable forest management. FSC also accredits and monitors third-party certifiers. The FSC trademarks gives a guarantee to consumers to choose products that support forest conservation and facilitate the market to provide an incentive for better forest management. In USA FSC is based in Minneapolis, Minnesota, and operates as a National Office of FSC International, which is based in Bonn, Germany.



The Programme for the Endorsement of Forest Certification (PEFC) is an international, non-profit, non-governmental organization. It promotes sustainable forest management through independent third party certification. It is the certification system of choice for small forest owners. It works throughout the entire forest supply chain to promote good practice in the



forest and to ensure that wood and non-wood products of forest complied ecological, social, and ethical standards. PEFC is an umbrella organization. It works by endorsing national forest certification systems developed through multi-stakeholder processes and tailored to local priorities and conditions. PEFC is the world's largest forest certification system with more than 30 certified national certification systems and approximately 240 million hectares of certified forests. It is based in Geneva Switzerland.

The Sustainable Forestry Initiative (SFI) is a forest certification standard. It is a non-profit organization. The American Forest and Paper Association launched it in 1994. The PEFC has recognized the SFI standard in 2005. It requires independent, third party audits and is executed by internationally accredited certification bodies. It certifies lands in the US and Canada, and programme participants should comply with all applicable laws.



Source: http://www.fsi.org.in/cover_2011/summary.pdf
<http://pib.nic.in/newsite/erelease.aspx?relid=80170>
<http://moef.nic.in/divisions/fp/nfp.htm>
<https://us.fsc.org/certification.194.htm>
<http://www.pefc.org/about-pefc/who-we-are>
www.sfiprogram.org

Eco Mark Criteria of Wood Substitutes – An Indian Scene

Ministry of Environment & Forest has notified criteria for labeling wood substitutes as environment friendly products. Bureau of Indian Standards (BIS) formulates/ incorporates optional standards for environment friendly characteristics. The criteria follow a cradle-to-grave approach, i.e. from raw material extraction, to manufacturing, and to disposal. The 'Ecomark' label is awarded to consumer goods, which meet the specified environmental criteria and the safety, quality, and performance requirements of Indian Standards also. A product which is eligible for marking with Eco logo, it shall also carry the Standard Mark of BIS besides meeting additional environment friendly requirements. For this purpose, the Standard mark of BIS would be single mark being a combination of the BIS monogram and the Eco logo.



Requirement for Eco friendliness is an additional; manufacturing unit is free to opt for Standard Mark alone also. The Scheme is voluntary. Any product with the Ecomark will be the right environmental choice.

Before acquiring the eco mark, the product manufacturer should produce the consent clearance, as per the provisions of Water (Prevention and Control of Pollution) Act 1974, Water (Prevention and Control of Pollution) Cess Act 1977 and Air (Pollution and Control of Pollution) Act 1981, along with the authorisation if required under Environment (Protection) Act 1986 and rules made thereunder to Bureau of Indian Standards while applying for the ECOMARK appropriate with enforced rules and regulations of the Forest Department. The product or product packaging may display in brief the criteria based on which the product has been labeled Environment Friendly. The material used for product packaging should be recyclable, reusable, or biodegradable.

Product Specific Requirements:

Substitutes for fuel-wood:

Briquettes shall be made from agricultural and wood residues (like saw dust) and domestic wastes (like garbage) without synthetic binders, for industrial and domestic use. Such briquettes shall not be manufactured from any wastes material, which contain any hazardous constituents as specified under Hazardous Wastes (Management and Handling) Rules, 1989.

Substitutes for Wood Building Material

Building boards generally used as partitioning, paneling, cladding and false ceiling shall be made from agricultural or industrial wastes such as Phospho-gypsum, red mud, bagasse, cotton stalk, rice-husk, coir fibre, sisal fibre or wood residues etc., or wood from sources other than natural forests or environment friendly plastics as notified separately. Door and window frames and shutters used in buildings shall be made from agricultural or industrial wastes or wood residues or wood from sources, other than natural forests or ferro-cement or building boards specified in the standard or environment friendly plastic as notified separately or frames made from enforced cement concrete.



Substitutes for Wood in Furniture:

The furniture (table, chairs and Stool etc.) shall be made from agricultural or industrial wastes or wood residues or wood from sources other than natural forests or building boards specified in the standard or environment friendly plastics as notified separately.



The Ecomark criteria is incorporated in the following BIS standards of wood substitutes

1.	IS 303:1989	Plywood for general purposes.
2.	IS 1003(Pt.1): 2003	Timber panelled and glazed shutters. Part 1:Door
3.	IS 1003(Pt.2): 1994	Timber panelled and glazed shutters. Part 2: Window and ventilator shutters
4.	IS 1829(Pt.1): 1978	Library furniture and fittings. Part 1 Timber
5.	IS 2191 (Pt.1): 1983	Wooden flush door shutters (cellular and hollow core type). Part 1: Plywood face panels
6.	IS 2191 (Pt.2): 1983	Wooden flush door shutters (cellular and hollow core type). Part 2: Particle board and hardboard face panels
7.	IS 2202(Pt.1): 1991	Wooden flush door shutters (solid core type): Part 1 Plywood face panels
8.	IS 2202(Pt.2): 1991	Wooden flush door shutters (solid core type): Part 2 Particle board face panels and hardboard face panels
9.	IS 2849:1983	Specification for non-lead bearing gypsum partition
10.	IS 3129:1985	Low density particle boards
11.	IS 3308:1981	Specification for wood wool building slabs
12.	IS 4021:1995	Timber door, window and ventilator frames
13.	IS 4116:1988	Wooden shelving cabinets (adjustable type)
14.	IS 4126:1986	Wooden wardrobes (adjustable type and non adjustable type)
15.	IS 4414:1990	Specification for wooden table tops
16.	IS 5823:1986	Dining tables
17.	IS 5923:1986	Wooden clothes lockers
18.	IS 5974:1986	Specification for divans and easy chairs
19.	IS 6188:1988	Specification for wooden bedside table
20.	IS 6198:1992	Ledged, braced and battened timber door shutters
21.	IS 6523:1983	Specification for precast reinforced concrete door
22.	IS 6632:1988	Specification for wooden folding chairs
23.	IS 7070:1988	Wooden shelving racks (adjustable type and non adjustable)
24.	IS 7259(Pt.1): 1988	Specification for wooden beds: Part 1 For use with mattresses
25.	IS 11525: 1986	Wooden chairs for office purposes
26.	IS 11679:1986	Wooden tables for office purposes
27.	IS 12680:1989	Wooden sofa-cum-bed
28.	IS 14587:1998	Testing and Inspection for Prelaminated Medium Fibre Density Boards

The incorporation of Eco-mark requirements, in the following BIS standard of wood substitutes is under process

1.	IS 1658:2006	Fibre hardboards
2.	IS 1659:2004	Block boards
3.	IS 2095(Pt.1): 2011	Gypsum plaster boards
4.	IS 2095(Pt.3): 1996	Gypsum plasterboards: Part 3 Reinforced Gypsum plasterboards.
5.	IS 3087:2005	Practice boards of wood and other Lingnocellulosic materials (medium Density) for general purposes
6.	IS 4126:1986	Wooden wardrobes (adjustable type and non adjustable type)
7.	IS 4962:1968(Inactive)	Specification for wooden side sliding doors
8.	IS 4990:2011	Plywood for concrete shuttering work
9.	IS 5509:2000	Fire retardant plywood
10.	IS 12406:2003	Medium Density Fibreboard for General Purposes
11.	IS: 12823:1990	Wood products - pre laminated Particle boards
12.	IS 12896:1990	Classification of Indian timbers for doors and window shutters and frames

There are many companies producing wood particleboards, fibreboards, plywood, MDF boards, have Eco mark in their products. Companies are

- Bajaj Eco-Tec products Ltd. Meerut, Uttar Pradesh
- Mangalam Timber Products Ltd Nabrangpur (Orissa)
- Greenply Industries Ltd. 24 Parganas, West Bengal
- NUCHEM LTD. Tohana, Fatehabad, Haryana
- Shivdhan Boards Pvt. Ltd. Nagpur, Maharashtra
- Ecoboard Industries Ltd, Pune, Maharashtra
- Shri Shankar Vijay Saw Mill, Kolhapur, Maharashtra

Source:

<http://nicdc.nic.in/eco/%28S%28beltis5hntllpqwuj3lvn3bl%29%29/ListofAllindiaEco.cshmtl>

http://www.cpcb.nic.in/EnvironmentalPlanning/Eco-label/Wood_Substitutes.pdf

Wood Substitutes and their types

Wood substitutes are normally made from agricultural wastes like sugarcane bagasse, rice husk, cotton stalk, and other agricultural crop residues or from wood that cannot be used as timber- twigs and small branches. These materials are slowly gaining acceptance among the major furniture manufacturers. Consumers have not only option of plain wood but now have wood substitutes range from simple wood particle boards, fibre-boards, plywood, MDF boards, and even gypsum combinations. The use of wood substitutes depends on the project and consumers' personal preferences.

The Particleboard is an engineered wood. This type of wood substitute is created by combining wood particles - chips or saw mill shavings or saw dust- with



a synthetic resins or resin bonding agent. It is then pressed and extruded. It is a three-layered board with fine particles on the top and bottom surfaces and larger wood flakes in the middle. It is also known as flakeboard or chip-board. It is a composite material with limited strength; it is used generally for non-structural projects.

The Hardboard is a manufactured product made from wood. It is constituted of wood fibres. These wood fibres are made of cellulose and lignins. Cellulose provides strength to the board and lignin being natural binder it cements fibres together and makes solid. These are highly compressed and pressurized under heat to bond as a hard product. It is similar to particleboard and fibreboard, but is much



harder and stronger. It is used in furniture making and interior furnishing and fitting. It absorbs water, so cannot be used for outside work.

The Gypsum Wallboard constituted primarily of gypsum, and a paper surfacing on the face, back, and long edges. These products contain gypsum and are covered with papers from both the sides



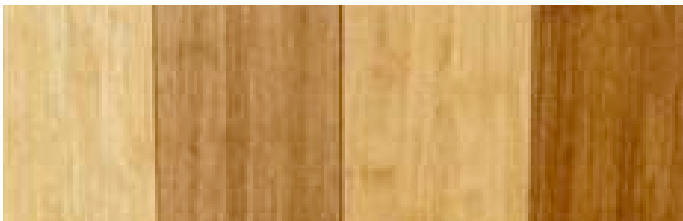
bonded to form a strong sheet. One side is treated for finishing. It is also popular as plasterboards, drywall, or wallboard. It is generally used for different types of interior decoration. This type of wood substitute is best for spaces built to be soundproof. Gypsum wallboard is also extremely useful when combined with fire-resistant materials. It is not re-usable therefore disposal is a problem.

The Fibreboard is a type of engineered wood and is a combination of different kind of wood fibres, vegetables, and recycled material. It is generally composed of softwoods like pine and also has wood scraps, sawdust, cardboard, and paper. It is a composite wood substitute and is not a wood in real sense. But it is a strong by nature and has a higher level of density. It is available in three varieties - low, medium, or high density. Medium-density fibreboard (MDF) is commonly in use.



Applications of low-density (LDF) and high-density (HDF) fibreboards are according their use where weight is an issue. HDF versions offer higher strength and durability. These are used for making furniture and cupboards and excellent for veneering. Its smooth surface holds paint. It is better to use these materials for interior use because it is susceptible to humidity and moisture. It has qualities of absorbing sounds and acts as insulation.

The Bamboo is fast becoming a promising wood substitute. It is always mistaken as Wood, but this grass can be used as substitute to wood. It is fast growing and strong enough to use in making



furniture and its wide variety used for construction material. Bamboo is zero waste plant. It has value from root to shoot. It can be used for flooring, furniture, construction, musical instruments, roofing, utensils, decorative accessories, food, paper, charcoal, energy, and bio-refinery

The Hemp has been rediscovered as a plant that has enormous environmental, economic, and commercial potential. Hemp is used as mechanical strengthener and can be chemically combined with



material. Hemp with gypsum and binding agents may produce light panels that might compete with drywall. Hemp is sustainable source of fibre and can replace the use of wood fibre for pulp and paper. A wide variety of construction materials can be made from Hemp fibre, such as composite fibreboard that is both lighter and strong.

Source:

<http://www.wisegeek.com/what-is-fibreboard.htm>

http://www.ehow.com/list_6897044_different-types-wood-substitutes.html

<http://www.mnn.com/your-home/remodeling-design/stories/10-materials-that-might-replace-wood-one-day>



The EcoLogo Program

Department of the Environment of the Canada Government established an ecolabelling scheme "The EcoLogo Program" in 1988. The "Environmental Choice" Eco-Logo symbol of certification is a green coloured maple leaf intertwined within three doves.

This logo provides a confidence to consumers that the products and services with this logo meet stringent environmental standards verified by a third party auditor. This programme is a Type I eco-label, as defined by the International Organization for Standardization (ISO). Type I is a multi-attribute label developed by a third party. It compares products/services with others in the same category. It develops rigorous and scientifically relevant criteria that reflect the complete lifecycle

of the product. It awards the eco logo symbol to those that are verified by an independent third party as complying with the criteria.

The EcoLogo Program is one of two such programs in North America that has been successfully audited by the Global EcoLabelling Network (GEN) as meeting ISO 14024 standards for eco-labelling. EcoLogo is more than a label. It's a marketing program to build market share for the world's most sustainable products.

Source: <http://www.ecologo.org/en/>

Write to us

We value your views and suggestions. Please send us your feedback on this issue.

We would also like to have your contribution on the information relevant to the Eco product and Eco labeling.

Please mail: cerc-env@nic.in



The FSC trademarks provide a guarantee to consumers that the products they buy come from responsible sources. The FSC trademarks enable consumers to choose products that support forest conservation, offer social benefits, and enable the market to provide an incentive for better forest management.

The FSC trademarks are thus essential to the whole FSC system.

FSC owns three registered trademarks:

- The initials " FSC® "
- The name " Forest Stewardship Council™ "
- The "checkmark-and-tree" logo figure

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सर्वो हि सुखकारकः ॥

