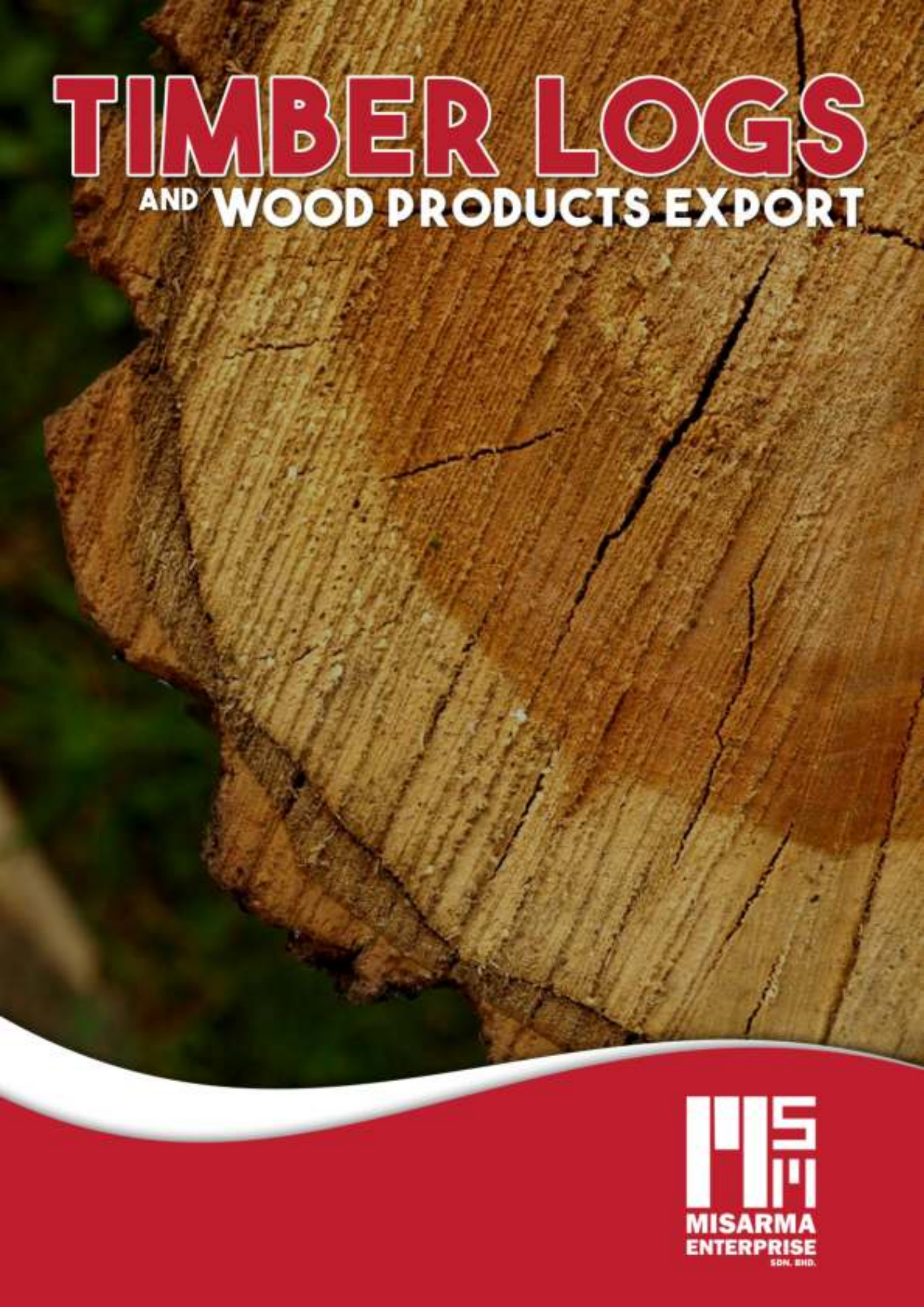


# TIMBER LOGS
## AND WOOD PRODUCTS EXPORT

MISARMA
ENTERPRISE
SDN. BHD.

# INTRODUCTION

Acacia mangium is a locally produced tree species. This species originated from Sarawak (a state in East Malaysia). It typically grows in lowlands below 100 meters above sea level. Acacia mangium tree can grow up to 30m. Generally, Acacia mangium is used for furniture making, such as cabinet, door frames, wooden moulds, light constru tion, pulp and paper production.

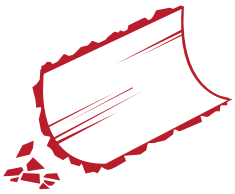
Acacia mangium is a large size tree, with the locally grown tree grows as high as 25-30m and diameter of 0.6m. The tree trunk is straight, with the trunk occupy up to half of the total tree length. However, when grown on poor and low fertility soil, it often grows as small tree or large shrubs that are about 7-10m high. The tree bark is thick, with longit dinal split. The colour ranges from grayish brown to brown. The base of the tree often develop groove.

Acacia mangium is native to coastal areas of Queensland, Australia, southwestern Papua New Guinea and eastern Indonesia. In such places, it generally distributed at altitudes below 100m and up to 800m. Acacia magium grows on coastal flats and gentle slopes, and is a typical lowaltitude tree species. It also often distributed behind mangroves, along rivers in the coastal area, well-drained low mountains and foothills.

Acacia mangium is one of the main forestation tree species in Malaysia. Following the annual increase production of Acacia tree, the usage of Acacia wood gets more extensive.

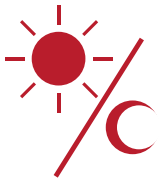
Acacia mangium is first introduced to Sabah, Malaysia in the year 1966. Since 1979, the Chinese Institute of Forestry has introduced a small amount of seeds from Queensland, Australia and has been well planted in Guangdong and Guangxi. Nowadays, large-scale plantation forests have been built in Guangdong, Guangxi, Hainan and other places, and it is one of the main tree species in short-cycle plantation in some tropical regions of China. Other than being an important raw material of paper pulp production, Acacia wood is also often being used as other wood processing material such as plywood, solid wood furniture and particle board.

# CHARACTERISTICS



### HIGH TANNIN CONTENT

The tree known to have high tannin content (18-39%), justifying commercial exploitation of tannins. Bark harvested for its tannins should only be taken from mature stems, and only when the sap is rising at the beginning of the growing season - which is when the tannin content is highest and the bark is most easily removed from the wood

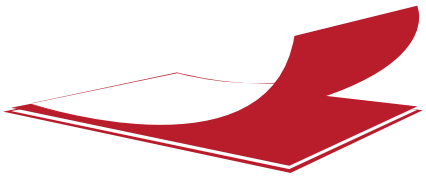


### RAPID SEASONING

Acacia mangium season rapidly. Therefore, constant checking is required as the tree have high risk of distortion. The tree eventually stables once it has beendried.

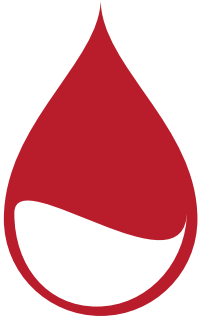
### SUITABLE FOR CONSTRUCTION USE

The wood is suitable for construction, boat, and furniture usage as the wood works well with ordinary tools.



### PULP AND PAPER MAKING

The pulp is readily bleached to high brightness levels and is excellent for papermaking. The neutral sulphite semi-chemical pulping of Acacia mangium gives yields of 61 - 75%.



### FOSSIL FUEL PRODUCT

Acacia mangium is used for fuel. With a calorific value of 4,800-4,900 kcal/kg, the tree provides good quality charcoal.

### MEDICINAL USAGE

The bark of Acacia Mangium contains astringent which are tannin which used to diarrhea and dysentery, and can also be helpful in cases of internal bleeding.

# PLANTATION PROCESS

## NURSERY AND SEEDING PROCESS

Seedlings are planted manually during the rainy season on freshly prepared sites, on which the recommended spacing has been marked out. Seedlings are planted in contour lines on slopes andin straight lines on flat areas. After its polythene bag is removed, each seedling is carefully placed into a planting hole of about 13cm in diameter and 20cm in depth.

## PLANTATION AND GROWTH

The tree then moves to a plantation site to be grow in a dedicated plantation location with spacing of 3x3m. In general, mean diameter increases rapidly up to 15 cm in stands less than 3 years old. Growth rates slow noticeably after the fifth year, and diameter begins to level off at around 25 cm by the age of 8 years.

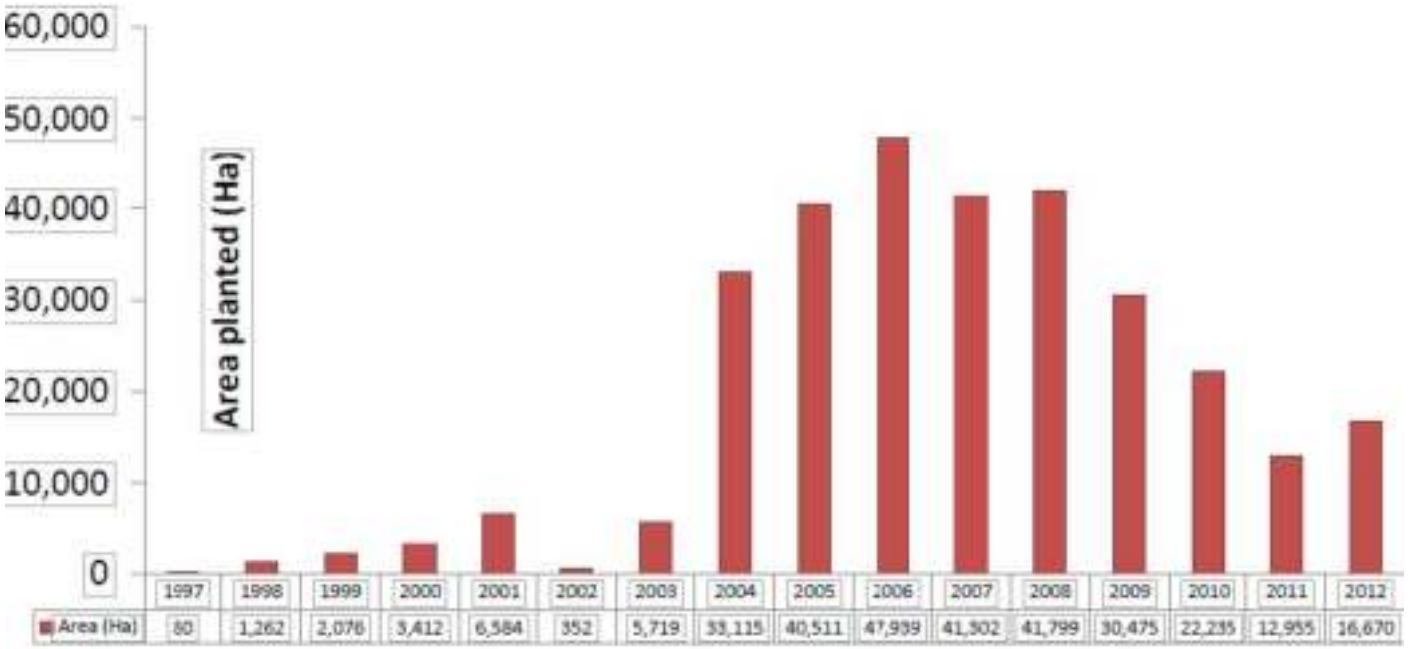
## HARVESTING AND STORAGE

After reaching a mature age, the tree will be harvested from the plantation and store in a log pond to be processed to product.

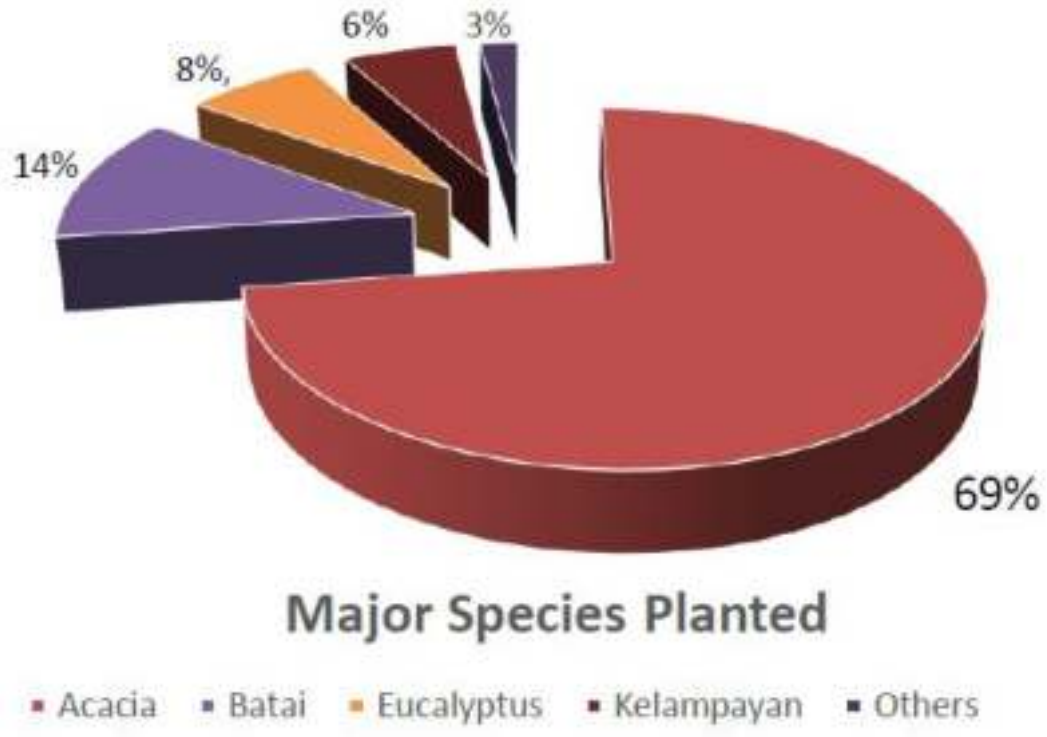
# LICENSE PLANTATION FOREST (LPF) DEVELOPMENT

The establishment of planted forests is a long-term strategy towards providing a new source of wood material for the wood-based industries in Sarawak. Act as a leverage to cope up with the increasing demand of raw materials as the industries cannot depend solely on timber from the natural forests. The planted forests will also help to relieve the harvesting pressure on the natural forests and at the same time increases the State's forest cover which will reduce the greenhouse effect. The picture below shows the License Plantation Forest in Sarawak (LPF) which are allocated for planting acacia and other tree species by the governments. In 1998, 1st LPF was issued for producing wood chip to help pulp and paper production. Since that, 42 LPFs have been issued by the Sarawak Government which consist of 2.8 million hectares with aim planting fast growing species with short rotation ranging 7-15 years.

Sarawak has aim to achieve a target of 1 million hectares of plantation forest. However, the progression of the forest plantation is slow about 20, 000 ha/year. Now there are only about 335,000 hectares have been planted. The decline mainly due to the financial constraint and issue of multiple land use as forests plantation is a huge investment and compounded with long maturation period. Therefore, LPF holders are required to come up with catch-up plans to accelerate their planting line with the approved TPP. The picture below show the ara of plantation forest since 1997 to 2012.



# MAJOR STOCKS AND SPECIES




The choice of species is depending on the anticipated market demands and current industry needs. The main species planted at plantation forest is acacia (69%), Batai (14%), Eucalyptus (8%) follow by Kelampayan (6%), and others at 3%.

The successful implementation of the forests plantations will create a new dimension in the timber downstream processing industry in Sarawak.Timber from the forests plantations will serve as a leverage and compliment to the deficit in timber production from the natural forests. It would also lessen the harvesting pressure on natural forests and thus promote the sustainability of forest resources for the future timber supply.

| No | Species | Area Planted | (%) |
|---|---|---|---|
| 1 | Acacia spp. | 230,110 | 69 |
| 2 | Batai | 46,457 | 14 |
| 3 | Eucalyptus spp. | 26,527 | 8 |
| 4 | Kelampayan | 20,833 | 6 |
| 5 | Others | 11,122 | 3 |
| Grand Total | | 335,049 | 100% |

# WOOD PRODUCTS

Acacia mangium tree heartwood's colour is brownish yellow shimmery and medium textured. Because the timber is extremely heavy, hard, very strong, tough, and not liable to warp and crack badly it is used for furniture, doors and window frames. The end product of acacia mangium is varied as the wood have as each part of the wood have it usages according to its grade.


Freshly harvested Acacia mangium timber log is categorised into 3 grades, following the standard of Malaysian Grading Rule (MGR):

- Grade A
- Grade B
- Grade C

| Acacia mangium Timber Log Grade | | | |
|---|---|---|---|
| **Grade** | **A** | **B** | **C** |
| Uses | Plywood | Sawn Timber, Solid wood furniture | Paper pulp |
| Sizes | Diameter: 20cm – 30cm Length: 5.8m and above | Diameter: 20cm – 30cm Length: 5.8m and above | Diameter: 8cm – 20cm Length: 5.8m and above |
| Appearance | Straight trunk, uniform diameter, no obvious defects | Straight trunk, no obvious bending, consistent size | Trunk cannot be altered into uniform size Worse standard than Grade B log |
| Air dry density | 0.88 g/cm$^3$ | | |

# WOOD PRODUCTS

## GRADE A

### PLYWOOD

Grade A Acacia mangium timber wood is suitable for plywood making. The wood of Grade A timber is straight, uniform trunk without obvious defects, able to produce very high quality plywood. Other than that, due to the stable and solid wood properties of Grade A Acacia mangium, it is suitable for the production of core sheets for decorative veneer and plywood.

- Solid wood board: Wood board is made from complete log timber. These wood plates are rugged and natural. However, this wood board is expensive and requires high construction techniques, and is usually used on floors and doors.
- Plywood: Mostly used in high-grade decorative base structure. It is suitable for installing and fixing decorative parts. Structure: It is made of three or more layers of one-millimeter-thick veneer.
- Decorative panel: commonly known as wood panel. It is a special way of splinting and the thickness is generally 3cm. It is a high-grade decoration materials using different oil mixing techniques. Structure: The solid wood board is precisely sliced into thin veneer with a thickness of about 0.2mm, and the veneer is used as a base material.
- Block board: It is made up of 2 veneers that are glued together in the middle. The price of this block board is cheaper than the plywood, and the vertical direction (different from the core material direction) is inferior to the bending strength, but the lateral bending strength is high. Block board is mainly used in furniture manufacturing, doors, windows, walls, heating covers, curtain door panel and so on.
  Structure: It is made up of a wood board with 2 veneers on both sides. The wood board in the middle is made of high-quality natural wood board and it heat-treated. After the middle wood board is covered with 2 veneers on both sides, it is then being cold and hot pressed.
- Particle board: Also known as low-density fiberboard, it is a wood that is pressed and extruded. Particle board is cheaper, denser and more uniform than conventional wood and plywood and is substituted for them when cost is more important than strength and appearance. It is mainly used in the furniture, construction industry and car manufacture.
  Structure: a thin plate made of wood scrap as the main raw material, and then added with glue and other additives.
- Fireproof board: It is a new type of material that is being used more and more. Due to its bright colour, variety of patterns, wear resistance, high temperature resistance, easy to clean, waterproof, moisture-proof and other good characteristic, it has become the leading product in the cabinet market.
  Structure: Generally consist of 3 layers of surface paper, coloured paper and multilayer craft paper. the refractory board has physical properties such as abrasion resistance and scratch resistance. Multi-layer kraft paper gives the refractory board good impact resistance and flexibility.
- Melamine board: Is a particleboard laminated with a thermally fused paper/resin coating to provide a durable hard surface. It is commonly used in the decoration of various furniture and cabinets because it is fairly easy to clean.
  Structure: Paper with different colors or textures is immersed in melamine resin adhesive, and then dried to a certain extent. It is then laid on the surface of particleboard and then hot pressed.
- Medium density fiberboard: It is an artificial board made of wood fiber. Medium density fiberboard is mainly used for making furniture, interior and exterior home decoration purposes, audio and vehicle interior decoration.

# WOOD PRODUCTS

## GRADE B

### SAWN TIMBER

- Sawn timber is a product of using sawmills machinery or hand tools to longitudinally saw log wood into smaller timber with a certain sizes (width, thickness, length). Acacia mangium generally has less wood deformation, doesn't crack easily, high bonding strength, good nail holding ability, good finishing quality, various colours, high utilization rate, good physical strength as in static bending strength and density, resistant to rot and fire.
- Sawn timber: wood density 0.88-0.96g/cm3, wood is slight pinkish, has elegant features, vivid wood pattern, beautiful and uniform structure, good wood strength, and strong rots resistance ability.
- The wood of Acacia mangium is fine and dense the centre of the wood is generally dark brown to brown colour, forming a unique natural texture. It is a high quality furniture material, and is also very suitable to be used as handicrafts and fine wood product. Acacia mangium is also the main raw material for woodbased wood panels and fibreboard.
- Freshly harvested Acacia mangium log has relatively high moisture content and high internal stress, especially the material variation from sapwood and heartwood. The shrinkage during drying is uneven, which makes the wood plate cracks and deforms easily. This requires more attention towards the sawing machinery and method. For drying process of the wood, both air drying and kiln drying should be utilised for even drying process. When undergoing kiln drying process, a weight is required to be pressed on top of the wood pile to prevent wood warping.
- Acacia mangium sawn timber can be made into many types of wood material, such as solid wood panel, decks, decorative panels and particle board. This sawn timber is suitable for the manufacture of solid wood furniture, doors, cabinets, veneers, plywood, beams, light building construction, shipbuilding, packaging materials, wooden pallets and etc.

## GRADE C

### WOOD CHIPS

- Wood chip is a product of chipping bigger size wood (such as log, tree branches, tree trunk, roots and wood processing residue) by using wood chipper machine into smaller size wood chip.
- The main uses of Acacia mangium wood chip is to produce paper pulp (paper pulp yield is as high as 54.6%).
- Only the heartwood and sapwood are useful for making pulp. Bark contains relatively few useful fibers and is removed and used as fuel to provide steam for use in the pulp mill. Most pulping processes require that the wood be chipped and screened to provide uniform sized chips.
- The paper pulp made from this Acacia mangium wood chip has elastic fiber, not easily grounded during refining process, thus producing pulp with better strength performance.
- The fiber composition is one of the most important aspects in order to produce high quality paper pulp. The average fiber length of Acacia mangium is about 993μm, which is much longer than the fiber length of its competitor Eucalyptus urophylla species.

# WOOD PRODUCTS

## Acacia mangium wood products producedby Misarma Enterprise Sdn. Bhd.

### SAWN TIMBER

Misarma Enterprise Sdn. Bhd. produces high quality acacia mangium sawn timber. Our sawn timber strictly follows the standard regulation of the Malaysian Grading Rule (MGR). The table below describes our sawn timber:

| Sawn Timber Specification | |
|---|---|
| Category | Description |
| Wood species | Acacia mangium |
| Sawn Timber Thickness | 22mm and above |
| Sawn Timber Width | 40mm and above |
| Sawn Timber Length | 100mm and above |
| Sawn Timber Cut | -Flat Sawn<br>-Rift Sawn<br>-Quarter Sawn |
| Standards | Malaysian Grading Rules (MGR) |


### WOOD CHIPS

Our company also produces Acacia mangium wood chips. The main usage of wood chips is to make paper pulp, but is not limited to that. Wood chips also often being used in making particle board (an engineered wood product manufactured from wood chips, sawmill shavings, or even sawdust, and a synthetic resin or other suitable binder, which is pressed and extruded; which also being known as density board. This particle board is mainly used in the manufacture of home furniture, construction work and cabin material for cars and trains).

| Wood Chips Specification | |
|---|---|
| Category | Description |
| Wood Species | Acacia mangium |
| Wood Chips Length | 20-40mm |
| Wood Chips Thickness | 3-8mm |
| Wood Chip Width | 5mm |
| Moisture Content | 20-40% |

### WOODEN BARK

Our company also export Acacia Mangium bark. In addition, the bark content tannins. Tannins (tannic acids) are naturally occurring complex chemicals found in plants. The taste is quite sharp or caustic, providing the distinctive astringency that humans associate with red wines, teas, and unripe fruits. In addition, tannins are used in the dyeing of textiles and in the tanning of leather products. In their condensed, secondary-metabolite form, tannins are highly toxic and insoluble compounds, and they bind to proteins and enzymes.

# WOOD PRODUCTS

## PAPER PULP

## PAPER PULP PROCESSING FLOW:

→ Wood chips
→ Screening
→ washing, soaking
→ pre-steaming
→ stage 1 spiral extrusion
→ stage 1 chemical impregnation
→ stage 2 spiral extrusion
→ stage 2 chemical impregnation
→ stage 1 high concentration refining
→ high concentration retention
→ subsequent refining
→ submersible
→ acidification washing
→ screening
→ concentration
→ pulp.

Based on a study done on the fiber content found on Eucalyptus and Acacia mangium wood shows that the average fiber length of Acacia mangium (1066μm) is longer than the one found on Eucalyptus wood (820μm): the cell wall cavity ratio of Acacia mangium is 0.48, which is smaller than the wall cavity ratio of Eucalyptus. Therefore, the fibre of Acacia mangium is more elastic than the Eucalyptus thus producing paper pulp with better strength performance. In addition, the density of Acacia mangium wood is lower than Eucalyptus, which will ease the penetration of chemical during pulping process. Based on this study, it is concluded that Acacia mangium wood chip is a suitable raw material for making paper pulp.

## PARTICLE BOARD

### Advantage of particle board:

- More cost-effective than natural wood, making them the perfect choice for offices and corporate spaces;
- Flat and smooth surface.
- Amount of glue used during particle board production is small thus is more environmentally friendly.

### Disadvantage of particle board:

- The internal material of particle board is granular, thus making it harder to be cut into desired size.
- Easily form uneven side surface caused by cutting action, required high technology and skill to cut.
- Quality of particle board in the market is not uniformly standard. Some particle board has high formaldehyde content and is not environmentally friendly.

## ADDTIONAL INFORMATION

- Our wood chips consumer from Indonesia includes PT Riau Andalan Pulp and Paper (RAPP).
- PT Riau Andalan Pulp and Paper is the largest and most advanced paper producer in the world, producing paper most efficiently. Riau Andalan Pulp &Paper (RAPP) is part of the APRIL Group major paper pulp company.
- RAPP is also one of the world's largest pulp mills in Sumatra, Indonesia.
- Our Acacia mangium plantation is about 12,000 Hectares; which is equal to 29652.646acre.

# EXPORT LICENSE

Our export license are obtained from Sarawak government that allowed us to export wood product and store those wood product. The wood product are categorized in number as show below:

- 0101 - Log
- 0302 - Sawn Timber
- 0201 - Wood Chip
- 0412 - Plywood
- 0508 - Furniture
- 0509 - Furniture Part
- 0801 - Pallet
- 0806 - Wooden Box
- 0912 - Sawdust
- 0208 - Bark
- 0404 - Particleboard
- 0902 - Charcoal

On the following page is our certificate of registration / license of our wood product.

PUSAKA

# CERTIFICATE OF REGISTRATION

**(Export, Import, and Local Sales / Storage of Timber)**
**THE SARAWAK TIMBER INDUSTRY (REGISTRATION) REGULATIONS, 2008**
**REGULATION 7 (2)**

| | | | |
|---|---|---|---|
| Registration No. | 0000485 | Expiry Date | July 27, 2023 |
| Annual Fee | 2,550.00 | | |

| | |
|---|---|
| Name of Company | MISARMA ENTERPRISE SENDIRIAN BERHAD |
| Address | LOT 2075, JALAN DISA, KROKOP<br>98000 MIRI<br>SARAWAK MALAYSIA |

| **Activities** | **Product Description (Details as overleaf)** |
|---|---|
| Exporter (E) | 0201, 0101, 0208, 0404, 0302, 0412, 0508, 0509, 0801, 0806, 0902, 0912 |
| Importer (I) | 0401, 0403, 0402, 0414, 0412, 0801, 0302 |
| Local Sale/Storage of Timber (T) | 0101, 0201, 0208, 0302, 0404, 0412, 0508, 0509, 0801, 0806, 0902, 0912 |

This is to certify the above company is registered with the Corporation and the registration approval is subject to the Conditions and Restrictions as attached with this Certificate.

**General Manager**

MISARMA
ENTERPRISE
SDN. BHD.

www.misarma.com

Lot 2075 Jalan Disa, Krokop,98000 Miri Sarawak
Tel: +6085 416 320 / 433 101
Fax: +6085 433801
Email: enquiry@misarma.com