

## Moso Bamboo and The Environment

### INTRODUCTION

Bamboo is not a wood, but a grass species. There are about 1300 different bamboo species of which 300 develop a "woody" pole, meaning that the material obtains actual wood characteristics (hardness, elasticity, shrink/swell, etc). Approximately 100 species are commercialized. The bigger (woody) bamboo species belong to the fastest growing plants / trees on earth. These bamboos will grow in 2 - 4 months to its full length. The species used by MOSO (actually called 'moso' or its botanical name: *Phyllostachys Pubescens*) can grow to 20m in that period! After that, the plant needs 4 years to develop a full wood structure. Every year new shoots will grow from the mother plant. Generally 25% of the poles in a bamboo forest or plantation can be harvested per year without decreasing the size of the plantation or the number of poles per hectare. By harvesting the older poles, more energy (light, water) is available for the remaining forest – therewith increasing the quality of the forest.

### RESOURCES AND LOCATIONS

Bamboo resources in China are estimated to be 6,000,000 hectares and can be found in several provinces. The bamboo used for MOSO products comes from:

- Zhejiang Province: Lishui county and Anji county
- Jiangxi Province: Fuzhou county and Yintan county
- Fujian Province: Nanping county, Sanming county and Longyan county

In the last decade, with a fast growing industrial utilization of the bamboo, the resources in China have been kept stable. Programs are in preparation (not only in China) to set up new bamboo plantations and to enlarge the currently existing resources. Compared to wood forests, bamboo plantations can be developed and become mature within 7 – 10 years, securing yearly harvesting of about 25% of the poles.

### HARVESTING PRACTISES AND CONTROL

The resources used for industrial bamboo products (like bamboo veneer, panels, tambour and flooring) are 'controlled forests', which are used by farmers. Each

year farmers harvest a part of the poles and sell these poles to processing industries (mostly strip producers who make the strips for specific products like flooring, panels, chopsticks, curtains, etc)

Harvesting of bamboo forest is controlled under the authority of The Forestry Bureau of China and local forestry administration. Following control procedures are applicable:

- A survey of forest resources is organized every 5 years by The Forestry Bureau of China to establish the size of all the forest resources.
- Based on the survey results and the principle "harvesting quantity must be less than growing quantity", the forestry administrations of provinces make a plan of how much may be harvested.
- The County Department distributes the allowed harvesting quantity to all the counties, towns and state-owned farms.
- All the farmers have to apply for a "Forestry Logging Permit" before they can harvest.

### INDUSTRY SELF CONTROL

Environmental aspects of harvesting and production are becoming more and more important for the industries itself. The main bamboo flooring and veneer manufacturers are member of the Chinese Bamboo Flooring Association, which is a part of the Chinese Flooring Association. The Chinese Flooring Association stays in direct contact with the Ministry of Forestry in China. The members have the obligation to respect the above described harvesting procedures and exchange information on environmental issues for further improvements.

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### FORMALDEHYDE EMISSIONS

Formaldehyde is a natural element which exists in all products. All materials around us emit formaldehyde (during time the emission decreases). A surplus of formaldehyde can be dangerous to human beings and that is why strict norms have been created to control the emissions of formaldehyde (i.e. E-norms in Europe, CARB in the USA).

MOSO uses materials in their products (mostly glues) with very low emissions. As a consequence, all MOSO products comply with the strictest norms. In Europe this is currently the E1 norm. It can be expected that the norms will be tightened in the near future (E0) and MOSO is already prepared: on request MOSO can use formaldehyde free glues (so called NAUF glues: No Added Urea Formaldehyde).

### CO<sup>2</sup> BALANCE

In various researches it has become clear that bamboo is an important and very fast CO<sub>2</sub> 'fixator'. This means that bamboo absorbs, during its growth and life until harvest, a relative big amount of CO<sub>2</sub> from the air / atmosphere. After the harvest this CO<sub>2</sub> will remain in the material and will only be released when this material is burnt.

On the other hand CO<sub>2</sub> is created by machines and transport means which are needed to produce the bamboo products and bring them to the customer. It is very important to keep the emission of CO<sub>2</sub> during this process as low as possible. By comparing the CO<sub>2</sub> fixation with the emission during production/transport the CO<sub>2</sub> balance can be determined. When the CO<sub>2</sub> fixation is larger than the emission, the product is CO<sub>2</sub> neutral. Research has shown that most MOSO bamboo products are CO<sub>2</sub> neutral. Calculations are available upon request.

### FSC

FSC means 'Forest Stewardship Council'. The Forest Stewardship Council is an independent, non-profit organization which promotes the responsible management of forests around the globe. They are non-governmental, and their list of requirements is decided by group consensus. They were established in 1993 to address exploitation and mismanagement

of forests, and to emphasize their social and ecological value. Certification ensures that companies that work in forested areas share and maintain FSC's core values.

Over the years, FSC has become an important international standard. However, for bamboo it has always been questionable if FSC certification is really necessary: bamboo is not a wood, it is a grass. And to produce bamboo products no deforestation is necessary or even possible: only the 5-6 years old plants are harvested.

The practical problem was that a lot of building contracts simply required FSC only materials. This would exclude bamboo automatically. In 2004 FSC has allowed bamboo into their system. In 2009 MOSO was FSC certified and so was the bamboo veneer (joint venture) factory DMVP. Although the FSC certified bamboo raw material is still rare, MOSO and DMVP can now offer FSC certified bamboo.

### MOSO INSPECTION AND CONTROL

To secure and guarantee environmentally sound practises and maintaining working procedures, MOSO has its own daily control activities executed by MOSO's representative company in Shaoxing (100% subsidiary of MOSO International BV).

### CONCLUSION

Bamboo is an environmentally sound material, which is cultivated in a very responsible manner. Control and monitoring systems are operational and function well to avoid over harvesting and to secure the protection of the resources. MOSO transforms this material, using environmentally sound techniques and materials.