

Module 7.1 Furniture Process



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Learning outcomes

This module will enable you to know:

- Basics of technology
- Basics of material sciences
- Mechanical processing of wood and wood based materials
- Gluing technology
- Finishing technology
- Assembling, packaging and storage of finished products

How to learn?

- This course could be taken using a “self directed” learning approach.
- For those attending “full time” courses a lecturer will be directing your learning using the learning materials available.
- For those enrolled on a “part time” basis a mixed approach could be employed.
- Please see below recommendations for each of the situations:

How to learn? Self directed approach

- We suggest the following sequence:
- Read the slides, watch the videos and reflect on the content.
- Read the additional text available where information is more detailed.
- If possible discuss with a colleague or register for a “Forum” and express your views.
- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
- If there are aspects that you find interesting and want to explore further access one of the texts recommended in the Bibliography

How to learn? Full time approach

- Attend all classes and the lecturer will provide explanations while showing the slides.
- Read the additional text available where information is more detailed.
- The lecturer will organise opportunities for you to discuss the content of the course so that you understand.
- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
- The lecturer will present a task for you to complete that will enable you to better understand the topic. The nature of the task depends on particular circumstances.
- If there are aspects that you find interesting and want to explore further access one of the texts recommended in the Bibliography

How to learn? Mixed approach

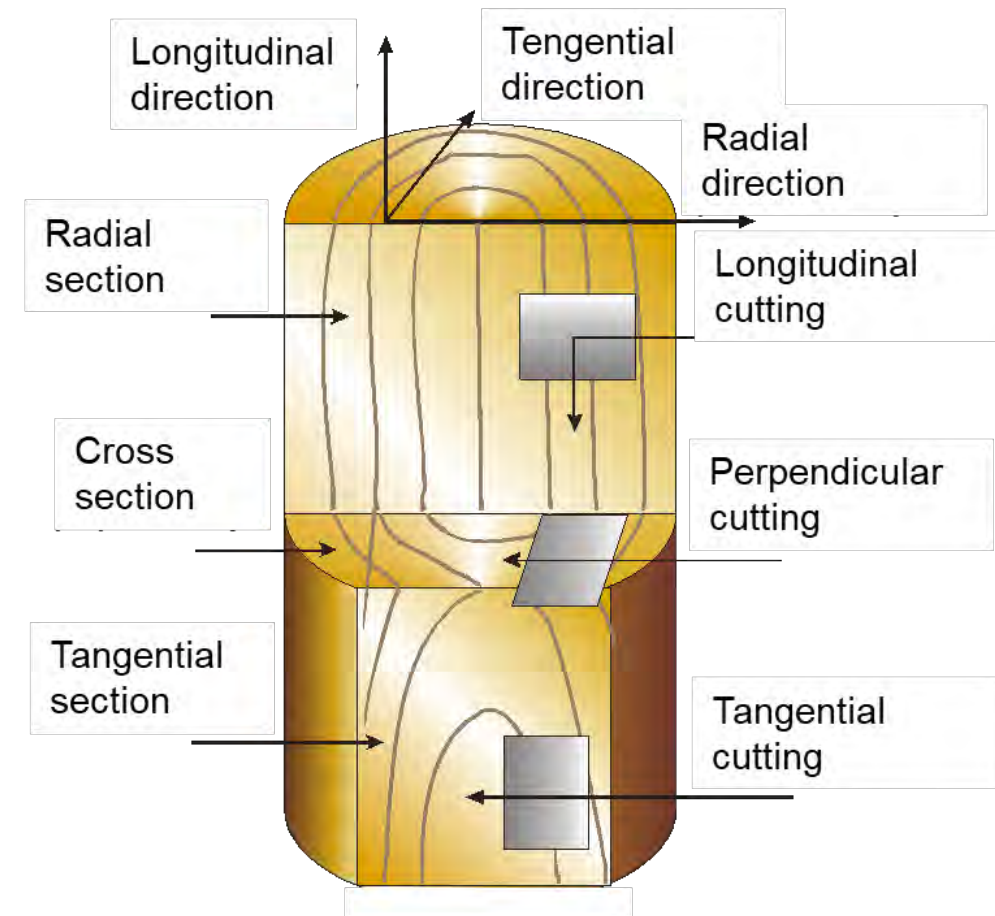
- Read the additional text available before attending the face to face classes.
- Attend all classes and the lecturer will provide explanations while showing the slides.
- The lecturer will organise opportunities for you to discuss the content of the course.
- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
- The lecturer will present a task for you to complete that will enable you to better understand the topic. The nature of the task depends on particular circumstances.
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Why study furniture process?

- Working in the production process as the supervisor.
- Managing company's technology and production routines in accordance to knowledge, good practices and standards existing in furniture production.
- With the help of other modules, one can apply innovation to the technology or improve processes.

Solid wood

- Main structure of solid wood is created with very flexible and strong fibers surrounded with soft lignin. They form a “brush” that act of a cutting tool. This “brush” is difficult to be controlled during cutting. Control in mains of very good quality of achieved surface and edge after processing.
- If solid wood is cut into different pieces various wood based materials are produced. From think wood sheet up to single fibers are formed and glued. Each of those manufactured material has got different properties and can be used for particular purpose or they applications can be similar.



Video Cutting with circular saw

- Video link: <https://www.youtube.com/watch?v=yvYjTEpw1BY>
- Short description: Circular saw is one of the most important tool in wood processing. It can help to create not only strait cutting but with many other tasks.
- Duration: 9.30 min

Wood based materials – panels / boards

There are lots of wood based materials. However, not all of them are widely used. From wood pieces size point of view, there are (from larges to smallest): block boards (boards / lumbers), plywood (wood large sheets), oriented strandboard (thin wood strands / flakes), particleboards (wood particles / chips) and fiberboard (wood bunch / wisp of fibers or single fibers). Separate wood based materials, made of several materials, use in furniture production are lightweight panels



<http://sguply.com/block-board.html> (October 2018)



<https://www.indiamart.com/proddetail/anchor-plywood-4865409955.html> (October 2018)



<https://www.indiamart.com/proddetail/particle-board-14729157991.html> (October 2018)



<https://www.batiproduits.com/fiche/produits/panneaux-alveolaires-a-faible-poids-p111562225.html> (October 2018)

Video Wood based materials

- Video link: https://www.youtube.com/watch?v=Z2Ytz0hW_jw
- Short description: It possible to used any of wood besed material for any purpose but there are regels that it governs these rights.
- Duration: 6.30 min

Production of veneers

Acentric process is very similar to peeling process. Main difference is that a part of log is cut. There are three main techniques to divide logs in two, three or four pieces. On the Figure there are machine and cutting of log quarter cut are presented. At the beginning radial and partially tangential sections are achieved.



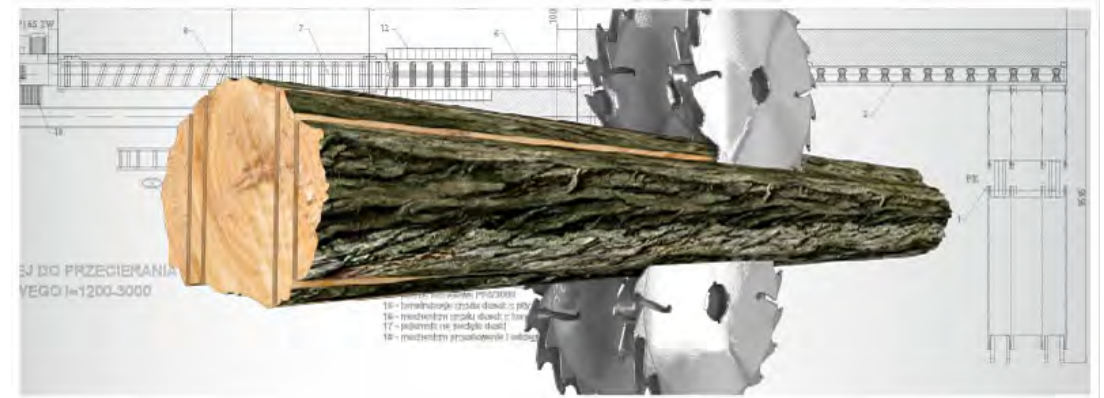
Mrozik - <http://www.braciamrozik.pl/> (November 2018)

Video Production of veneers

- Video link: <https://www.youtube.com/watch?v=AdYDsIhy2VU>
- Short description: For the process of veneers production it is important visual effect of material achieved.
- Duration: 15.00 min

Raw wood cutting

Raw wood cutting is the first step of any production. Wood in form of logs with different diameter and length and quality are selected according to further production processes. In those processes cutting tools are made of high speed steels, stellites and carbides. In first wood processing band saws, circular saws and frame saws are mostly used.



http://www.maszynytartaczne.pl/en/circularsawforlog_ttg.php (November 2018)

Video Frame saw

- Video link: <https://www.youtube.com/watch?v=cckvGMm1zVo>
- Short description: Frame saws like bend saws and circular saws are used to cut logs. But frame saws were adopted to cut small board into very thin elements too.
- Duration: 5.30 min

Dry wood and panels processing

Dry wood and panels are cut with tool made of different types high speed steels, carbides and diamonds. However, they are different in geometry. Decision which tool should be use depends on several points. The most important is size of enterprise and yield of material to be cut. high speed steels are the cheapest ones. It is used together with cemented carbides by micro and small sizes enterprises. Medium and large sizes enterprises are using cemented carbides and diamonds. Tool material selection depends on application.



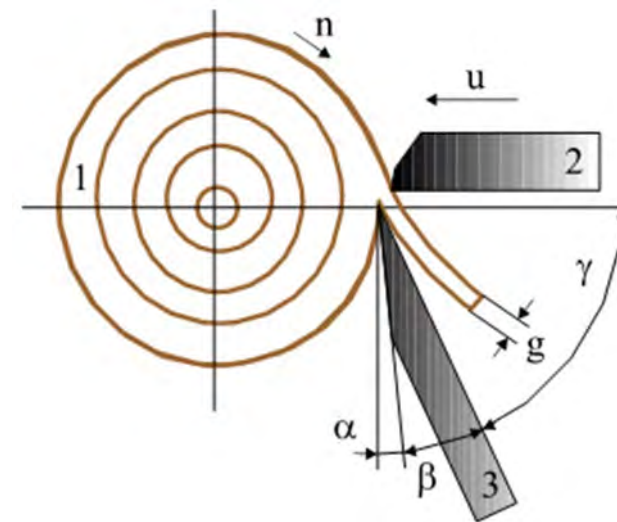
<https://pl.aliexpress.com/item/Sliding-table-panel-saw-wood-tools-saws-factory-wood-cutting-machine-price/32809717874.html> (November 2018)

Video Panels processing

- Video link: <https://www.youtube.com/watch?v=fWMpw3FBgBg>
- Short description: Most of furniture are made of panels nowadays.
- Duration: 6.30 min

Wood peeling

Construction veneers are produced with peeling process. Log (1) fixed in fastening elements is put into rotation with rotation speed n – cutting speed. Pressure bar (2) and knife (3) it's a rigid system. This system is moving towards the log with linear speed u – feeding speed. To achieve expected veneer thickness with constant feeding speed cutting speed accelerates when log's diameter diminishes. Position of cutting knife is defined with three angles: clearance – α , knife – β and rake – γ . Clearance angle is very small and changes from positive to negative values when log's diameter diminishes.



Video Wood peeling

- Video link: <https://www.youtube.com/watch?v=DnIxun5wfDg>
- Short description: Wood peeling process is to produce construction veneers.
- Duration: 6.30 min

Solid wood furniture

Solid wood furniture can be made of real solid wood and of block boards. In case of block board furniture are named as wooden furniture. Wooden furniture are most produced because they are more stable and can be produced of wood of less quality. In this case effective parts of wood are eliminated and only good quality pieces are taken into further production. Furniture made of wooden elements can be simple designed or stylised based on a special region



Furniture made of panels

Furniture made of panels products are usually case / box furniture: wardrobe, chest, cupboard and elements in box forms like for example drawer. Panel products are mostly ennobled from all surfaces. Especially particleboards are not accepted without surface finishing (Unit 6: Uses and applications for veneers and laminates). There are some big groups of furniture made of panel products. There are furniture for kitchen, sleeping room, bath room, offices and for kids.



<https://www.lifemark.co.nz/case-studies/blum-kitchens-cater/>

Video Wood peeling

- Video link: <https://www.lifemark.co.nz/case-studies/blum-kitchens-cater/>
- Short description: Kitchen is the place there really needs functionality.
- Duration: 1.00 min

Finishing

Stains are products used to change the colour of the substrate, while allowing the natural drawing of wood. This method is usually used for purposes of levelling the colour of the substrate, hiding superficial defects and increasing the value of less attractive wood species.



<https://www.labar.ca/stain.html> (March 2019)

Assembling

Furniture that are assembled in producer place usually assembled systematically. This is the way how upholstery furniture are manufactured. First of all material of furniture construction and covering materials are prepared. Then,, the process of assembly is performed. Step by step the next stages of production strive for the final stage.



DYNAMIC Furniture (<http://www.dynamic-brand.com/>)

Storage

There are two main places for materials storage. First is in the beginning of a production where raw materials and pieces of components are stored. Second is storage of ready to sale products. Although, manufacturers try to avoid both of storage places, this however is very difficult to achieve. there are also places for production for inter-processing of materials. But they take up much less space and do not require a large commitment of the pennants and resources.



DYNAMIC Furniture (<http://www.dynamic-brand.com/>)