

Appendix- Disc

The Appendix inside the disc are constituted by 4 different folders.

A.1 - TEST

Inside the folder A.1 – TEST one can find 4 different folders, one per each Series of experiments realized. For Series A to C inside these folders there are the experimental curves obtained for each test (in spreadsheets), the observations from the Series and an extra spreadsheet with all the curves from the Series, from which one can see the differences between the curves from the same Series. In every individual experimental curve's spreadsheets one can appreciate the adjustments made to every curve.

In series D, from the embedment test, one can find all the individual experimental curves of threaded and smooth nails, screws and dowels, in which the adjustments made in order to find the maximum stress (embedment strength) and the embedment stiffness K_e , can be appreciated. In addition, the observations and an extra spreadsheet with all the curves together is found.

A.2 – ANALYSIS

This folder contains 3 subfolders, 1 for the lateral load capacity experiment, a second one for the embedment experiment and a last one for the failure identification.

In the Lateral load capacity experiment density measurements and the numerical modeling spreadsheets can be found. In the numerical modeling spreadsheet one can find:

A first label called "All data" in which all the information from the experiments can be found. This label, however is not used for the generation of the model. The label used to generate the Yielding model is called "HINGES MODEL". In it, the specimens that failed due to Yielding mode are copied from the label "All data". Inside the label, one can find all the charts of DELTA against the variables and DELTA against dry density and moisture content, and also the cells that define the value of the K-values. These cells can be changed and automatically the regression modifies and the R^2 and the standard deviation of the DELTA is recalculated. Also, the regression line stratified by variables can be found in this label; one can find the same regression but each time the colors separating different variables. This way, between this stratified regressions and the charts of the DELTA against the variables, one can see if the K-value for a particular value of a variable is correct or not.

Next to this label there are two labels called "Exponents Hinges" and "Calculations Hinges". The first one is used to calculate the value of the exponents to adjust the dry density and the moisture content. One can see by modifying the values in the spreadsheet that imposition of zero does not affect the standard deviation of DELTA significantly. The second is only used to be able to do the stratified regression graphs.

Following this labels, the three same labels come but now for the Splitting failure mode. The use of the three is the same as explained for Yielding failure mode.

The two following ones are the statistical analysis of the density and the moisture content of the specimens. One can see the histograms and the t-Student validation.

After these two, one label per variable comes in which the same chart as shown in the report can be found.

For the embedment experiment, a spreadsheet with the density data is found together with the spreadsheet from the Numerical Modeling. In it, a first label called "DATA" with all the information out of the experiment is found. Next is a label with the regression models of all the variables for 0 to 90 degrees of fiber direction. The next one contains the regression made for the data for 0 to 30 degrees of fiber direction, and the last one contains a representation of the stress-embedment (3-segments) curve obtained.

The failure identification folder contains the data of the angles and the position of all the hinge points obtained from the failure identification.

A.3 - PICTURES

In this folder pictures from the lateral load, embedment and failure identification are found in distinct subfolders. The most relevant ones from all are the ones from the failure identification, in which one can see the shape of the fasteners and the shape left in the wood (center member and side members) by them.

A.4 – BIBLIOGRAPHY

Finally in this folder, the Standards consulted for this study are found.