

Supplementary Materials: A Multi-technique Approach to Evaluate the Surface Properties of Heat-treated Chestnut Wood Finished with a Water-based Coating

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Citation: Pelosi, C.; Rubino, G.; Capobianco, G.; Lanteri, L.; Agresti, G.; Bonifazi, G.; Serranti, S.; Picchio, R.; Lo Monaco A. A Multi-Technique Approach to Evaluate the Surface Properties of Heat-treated Chestnut Wood Finished with a Water-Based Coating. *Coatings* **2021**, *11*, 706. <https://doi.org/10.3390/coatings11060706>

Academic Editors: Ruslan Rushanovich Safin and Aigul Ravilevna Shaikhutdinova

Received: 3 May 2021

Accepted: 8 June 2021

Published: 11 June 2021

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Hyperspectral imaging data

The score plot of the second and third principal components (PC2 and PC3), obtained by PCA (Figure S1), shows four different clouds, representative of the selected reference wood specimens (i.e. coated and uncoated untreated wood, coated and 140 °C thermally treated coated and uncoated specimens). The PC2 highlights the spectral variance between uncoated and coated specimens, while PC3 highlights the main variation between untreated and 140 °C thermal treated specimens.

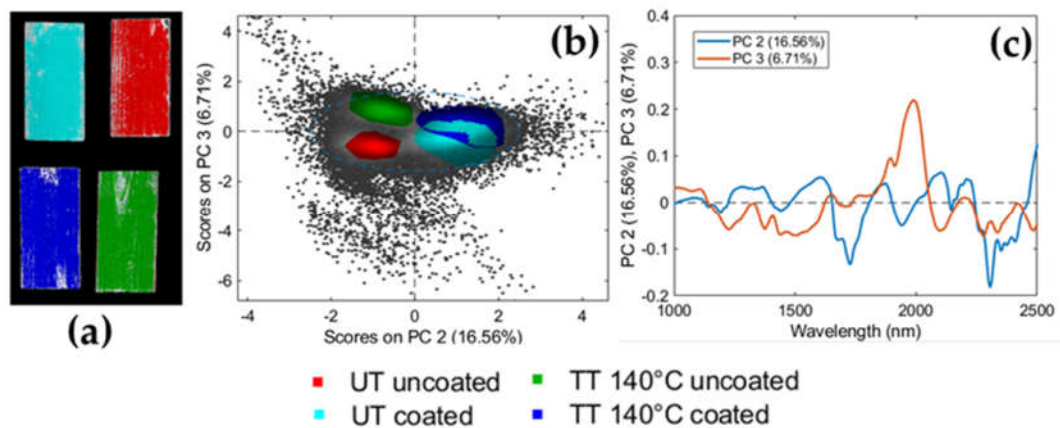


Figure S1. Raw hyperspectral image highlighting the classes UT and TT 140°C coated and uncoated (a), clustered in the corresponding PCA score (b) and loading (c) plots.

The score plot of PC2 and PC3, obtained by PCA (Figure S2), shows four different clouds, representative of the selected reference wood specimens (i.e. coated and uncoated untreated wood, coated and 170 °C thermally treated coated and uncoated specimens). The PC2 highlights the spectral variance between uncoated and coated specimens, while PC3 highlights the main variation between untreated and 170 °C thermal treated specimens.

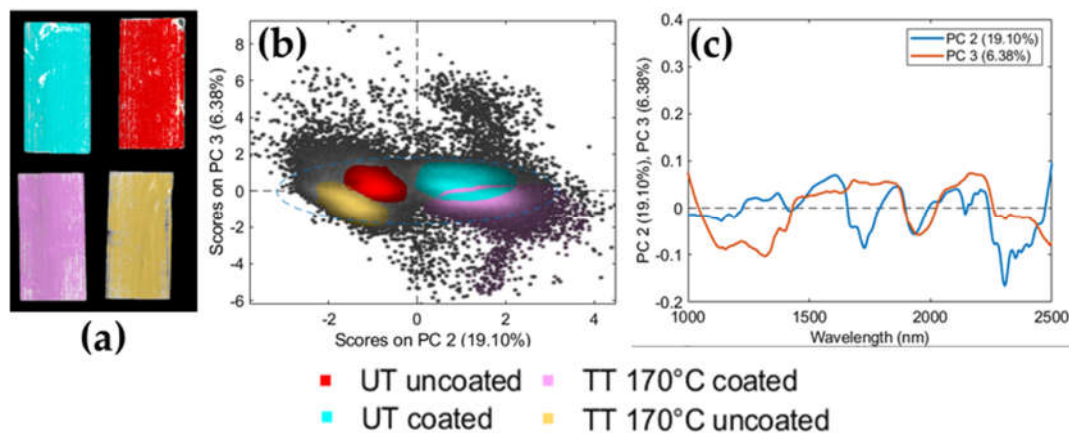


Figure S2. Raw hyperspectral image highlighting the classes UT and TT 170 °C coated and uncoated (a), clustered in the corresponding PCA score (b) and loading (c) plots.

The score plot of PC1 and PC2, obtained by PCA (Figure S3), shows four different clouds, representative of the selected reference wood specimens (i.e. coated and uncoated untreated wood, coated and 200 °C thermally treated coated and uncoated specimens). The PC1 highlights the variation between untreated and thermal treated at 200 °C specimens, while PC2 highlights the spectral variance between uncoated and coated

specimens. In detail, the PCA score plot highlights a distinctive separation between UT and TT 200 °C coated specimens.

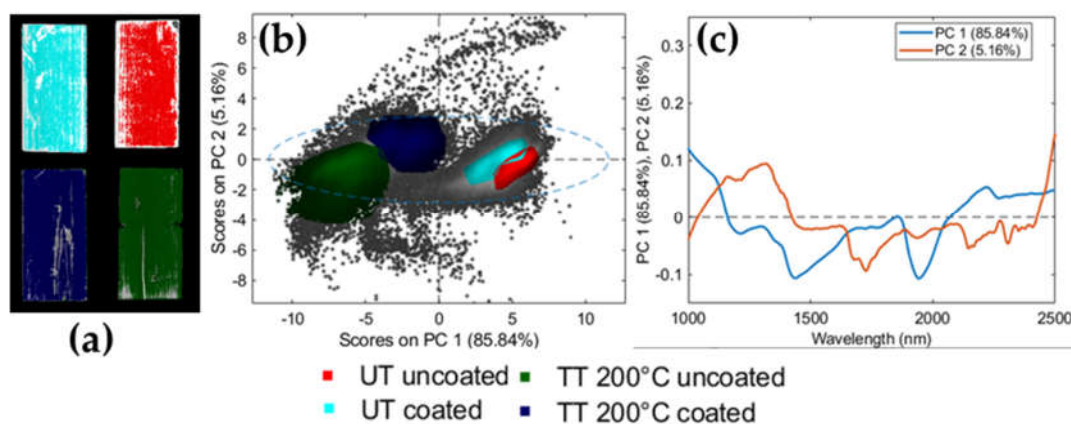


Figure S3. Raw hyperspectral image highlighting the classes UT and TT 200 °C coated and uncoated (a), clustered in the corresponding PCA score (b) and loading (c) plots.

Table S1. Sensitivity and Specificity in calibration (Cal) and cross-validation (CV) for each rule of HI-PLSDA. model.

Rule 1	1	2	Classification output
Sensitivity (Cal):	0.998	0.996	1. TT 200 °C coated+ TT 170 °C coated+ TT 140 °C coated+ UT coated 2. TT 200 °C uncoated + TT 170 °C uncoated + TT 140 °C uncoated + UT uncoated
Specificity (Cal):	0.996	0.998	
Sensitivity (CV):	0.998	0.996	
Specificity (CV):	0.996	0.998	
Rule 2	1	2	1. TT 200 °C coated 2. TT 170 °C coated+ TT 140 °C coated+ UT coated
Sensitivity (Cal):	0.998	0.997	
Specificity (Cal):	0.997	0.998	
Sensitivity (CV):	0.998	0.997	
Specificity (CV):	0.997	0.998	1. TT 200 °C uncoated 2. TT 170 °C uncoated + TT 140 °C uncoated + UT uncoated
Rule3	1	2	
Sensitivity (Cal):	0.987	0.999	
Specificity (Cal):	0.999	0.987	
Sensitivity (CV):	0.987	0.999	1. TT 170 °C coated 2. TT 140 °C coated+ UT coated
Specificity (CV):	0.999	0.987	
Rule 4	1	2	
Sensitivity (Cal):	0.993	0.993	
Specificity (Cal):	0.993	0.993	1. TT 170 °C uncoated 2. TT 140 °C uncoated from UT uncoated
Sensitivity (CV):	0.994	0.99	
Specificity (CV):	0.99	0.994	
Rule 5	1	2	
Sensitivity (Cal):	0.959	0.999	1. TT 140 °C coated 2. UT coated
Specificity (Cal):	0.925	0.001	
Sensitivity (CV):	0.961	0.974	
Specificity (CV):	0.974	0.961	
Rule 6	1	2	1. TT 170 °C uncoated 2. TT 140 °C uncoated
Sensitivity (Cal):	0.987	0.988	
Specificity (Cal):	0.988	0.987	
Sensitivity (CV):	0.987	0.987	
Specificity (CV):	0.987	0.987	1. TT 170 °C uncoated 2. TT 140 °C uncoated
Rule 7	1	2	
Sensitivity (Cal):	0.993	0.991	
Specificity (Cal):	0.991	0.993	
Sensitivity (CV):	0.993	0.992	
Specificity (CV):	0.992	0.993	