Helber Antonio Esquivel-Puentes

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EDUCATION

PhD, Mechanical Engineering, Purdue University, *West Lafayette, IN. USA.* **In progress**

Master's Degree, Materials and Process Engineering, *National University of Colombia, Bogotá D.C., Colombia.* **09/2017**

Thesis: Production and characterization of DLC/ZrO_2 bilayers using sputtering and CVD assisted by plasma techniques.

Bachelor's Degree, Mechanical Engineering, *National University of Colombia, Bogotá, Colombia* **03/2015**

RESEARCH PROJECTS

Design, modeling, simulation and construction of HAWT's fitted with hydrostatic transmission for energy and water generation PhD project **06/2018-present**

- Design, modeling and simulation of the structure, hydrostatic transmission and incoming flow interaction of horizontal axis wind turbine of 3kW nominal power.
- Construction and open field test of the HAWT in order to measure the power spectrum under turbulent incoming flow and its effect on energy and water generation.

Deposition of a-C:H on Ti6Al4V, Msc project **08/2015 – 06/2017**

- Deposition of a-C:H film on ZrO_2 interlayer using microwave chemical vapor deposition.
- Characterization of chemical structure of a-C:H film, surface microstructure, morphology, stress measurement, wear performance and corrosion resistance test.

Deposition and characterization of ZrO_2, Msc project **08/2015 – 06/2017**

- Deposit a ZrO_2 film using R.F. sputtering with YSZ target.
- Crystalline structure, microstructure, thickness and chemical composition characterization.

Deposition of DLC films on Inconel, intern
Advisor: Vladimir Jesus Trava-Airoldi
National Institute for Space Research, Clorovale and Petrobras **09/2014-04/2015**

- Deposition of DLC film using PECVD
- Structure characterization and adherence measurement

PROFESSIONAL EXPERIENCES

Teaching Assistant, Mechanical & Mechatronics Engineering Department, **06/2017**
National University of Colombia
2017278 –**Mechanical Technology**

Visiting Researcher, Birck Nanotechnology Center, Purdue University **12/2016**
Advisor: Timothy Fisher

- Deposition of a-C:H layer handling a MPCVD system
- Structural and morphological characterization of a-C:H layer

Teaching Assistant, Mechanical & Mechatronics Engineering Department, **06/2016**
National University of Colombia
20157 11 – **Technical Basic Drawing**

National Institute for Space Research, Sao Jose dos Campos, Brazil **03/2015**

Researcher

- Deposition of DLC layer handling a PECVD system with active screen on Ni~alloy
- Characterization of a-C:H using FE-SEM, Raman spectroscopy, AFM
- Evaluation of wear behavior of DLC layer

SKILLS

Software

- *Professional Packages:* HighScore Plus X´pert PRO, Gwyddion, Vision64, CERT-UMT-2M-110, Gamry, CasaXPS, Origin, NX Unigraphics, Ansys, Inventor, SolidWorks, AMEsim, and MS Office.
- *Programming Language:* MatLab.

***L*aboratory**

- **Handled and analysis**: Fluid power systems, Microwave plasma chemical vapor deposition, pulsed PECVD, R.F. PECVD, UBM sputtering, R.F. sputtering, SEM, Raman spectroscopy, X-ray diffraction, EDS, WDS, AFM, FTIR, pin-on-disk, scratch test, nanoindenter, electrochemical impedance spectrometry (EIS), polarization potentiodynamic corrosion test, Bruker interferometer, Veeco stylus profilometer, nondestructive test.
- **Analysis**: XPS, TEM, wear, corrosion and failure analysis.

Certification

- *FORISTOM Electrochemical impedance spectroscopy (EIS) in micrometric spaces for characterization of nanomaterials*
- *WEST ARCO Theory in welding processes, joint geometries, symbology in unions welded, electrode classification.*

Languages

- *English (Fluent)* • *Spanish (Native)* • *Portuguese (Intermediate)*

PEER REVIEWED PUBLICATIONS:

M. Roggenburg, **H.A. Esquivel-Puentes**, A. Vacca, *et al, "Techno-economic analysis of a hydraulic transmission for floating offshore wind turbines", Renewable Energy,* vol 153, pp. 1194-1204, 2020.
Available: https://www.sciencedirect.com/science/article/abs/pii/S0960148120302470

H. A. Esquivel-Puentes, T. S. Fisher, G. Capote, and J. J. Olaya, "Bias effects on wear and corrosion behavior of amorphous hydrogenated carbon films with zirconia interlayer," *Surf. Coatings Technol.*, vol. 350, no. January, pp. 603–620, 2018.
Available: https://www.sciencedirect.com/science/article/abs/pii/S0257897218307552

Orozco-Hernández, G., Lopez-Córdoba, L., **Esquivel-Puentes. H.,** Olaya, J., Alfonso Orjuela, J., Pineda-Vargas, C. Characterization of Bismuth Oxide Thin Films Deposited Via Unbalanced Magnetron SPUTTERING. Revista Latinoamericana de Metalurgia y Materiales, *2017, 37(2)*: 186-194. Available: http://rlmm.org/ojs/index.php/rlmm/article/view/782

CONFERENCE PROCEEDINGS

H.A. Esquivel-Puentes, A. Vacca, L.P. Chamorro, J. Garcia-Bravo, H Bocanegra-Evans, D. Warsinger, W. Gutierrez, L. Castillo. Experimental comparison of HAWT's with hydrostatic and regular transmissions, 72nd American Physics Society Division of Fluids Dynamics. Seattle. WA. USA. **11/2019**

H.A. Esquivel-Puentes, M. Roggenburg, E. Fenollal, D. Warsinger, J. Garcia-Bravo, M. Ivantysynova, A. Vacca, L.P. Chamorro, H. Bocanegra-Evans, L. Castillo. Wind turbines fitted with hydrostatic transmission: performance and turbulence effects, 71st American Physic Society, Division of Fluids Dynamics. Atlanta. GA. USA **11/2018**

H.A. Esquivel-Puentes, T.S. Fisher, J.J. Olaya. Synthesis of a-C:H via chemical vapor deposition, 4th International Meeting for Researchers in Materials and Plasma Technology. Santa Marta, Colombia. ISSN 2422-3824 **05/2017**