

ABDELHAK AZZI

31 years

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Citizenship: Algerian from birth

Residence: France since 2013

License drive: B



EDUCATION

2015-2019

Angoulême, FRANCE

University of Poitiers

Ph.D. degree in mechanics of solids, materials, structures and surfaces

Ph.D between Cetim Company and PPrime Institut

Supervisors: Prof. Dr. Aurelian FATU, Prof. Dr. Dominique SOUCHET

Industriel Supervisors : Dr : Abdelghani MAOUI, Didier Freiburg

Thesis: **Numerical and experimental study of sealing systems for pneumatic seals**

2013-2014

Bordeaux, FRANCE

University of Bordeaux

Master degree in Mechanics and Engineering

Supervisor: Prof. Dr. Elena Palomo Del Barrio

Laboratory: I2M Bordeaux

company: Abengoa Solar

Disertation: **Modeling of phase change materials (PCM) for high temperature energy storage**

2008-2013

Boumerdes, Algeria

University of Boumerdes

Engineer degree in mechanical engineering

Supervisors: Prof. Dr. Aissani SLIMANE

Company: General Electric

Disertation: **Study of the vibratory behavior of the gas turbine MS 5002 C.**

Languages :

English: Proficient speaker (B1-B1)

French: Fluent

Arabic: Fluent

Tamazight: Native Language

Computing skills and development of engineering software:

Microsoft Office, Surfer, Grapher, MATLAB, Fortran.

CAD/CAE: Abaqus, MSC software (Marc, Patran & Mentat), ANSYS

(APDL/Workbench), HyperMesh, Solidworks, CATIA. PTC Creo (CAE, Simulate)

Programmation: A keen Fortran, Python, Matlab and Labview programmer and computer enthusiast.

voluntary activities

Founder and Treasurer of the Youth Association for Development and Ecology,

Member of Society of Tribologists and Lubrication Engineers (STLE).

PROFESSIONAL EXPERIENCES

Teaching Experience

Teaching assistant/ Teacher

2017-2018

Angoulême, FRANCE

- Holding tutorial sessions in Mechanics with the second-year and third- year students of Technical University Institute of Angoulême.

- Teaching Solid mechanics and Finite Element Method.

Trainer Experience

Trainer assistant

2016-2017

Nantes, FRANCE

- Lubrication of dynamic seals: phenomena and modeling principles

- Sealing of linear hydraulic and pneumatic transmission systems

Sealing Systems & Simulation Expert

Technical follow-up of the full product lifecycle including its design, test, simulation, validation, research, and technical support.

➤ **Design**

- Detailed knowledge and practical application experience of lubrication theory, seals design and sealing technology; with proven ability to select, monitor and trouble-shoot lubricants and seals.
- Choice of materials, manufacturing processes used to produce elastomeric seals and seal assemblies.
- Design of advanced dynamic and static sealing for hydraulic systems (motor, valve and pump)
- Sealing integration (sizing, tightening, surface condition, mounting and installation)
- Brainstorming concepts for new components, systems, methods to power and propel equipment. Simulation and testing to examine and progress concepts through our manufacturing facilities and make final products to help our customers build a better world.

➤ **Simulation**

Start seal profile studies, apply advanced computerized models to understand, verify, and improve the design of components, systems, products, and processes as well as interpreting results, and iterating until geometry and materials meet objectives.

➤ **Testing**

- Design and implementation of test benches for the qualification of sealing systems (Dust, Dynamic and static seals)
- Development of new sealing test procedures
- Sealing tests post-processing, analysis and reporting
- Estimation of the seal lifetime under test bench conditions and accelerate life test
- Sealing expertise (failure mode, ...etc)
- Take a design concept and put it to work to collect data, verify performance, and contribute to design enhancements,

➤ **Technical support**

- New specifications of different sealing
- Training supports
- Support for Sealing product buyers
- APQP , DVP and DVP@R procedures
- Support of application enginner department , quality department and process departement
- Knowledge standard

➤ **Research interests and expertise**

Research interests are focused on mathematical analysis and computational modeling in the field of Sealing and Tribology, using analytical and numerical methods. I have been involved in research in the following areas.

- Seal lifetime estimation
- Mechanical and thermal effects of debris particles and oil particulate contamination.
- Elastohydrodynamics and mechanics of polymeric and composite seals.
- Elasticity, thermoelasticity, poroelasticity, and rubber elasticity.
- Fatigue life calculation of seals compared to experimental tests.
- Finite difference and finite element analysis. Analytical solution of differential equations

Following is a list of the main programs developed with the FORTRAN 98 programming language.

- Program SEAL I. Transient, smooth elastohydrodynamic lubrication analysis, mechanics and performance analysis of composite seals (PTFE-elastomerPTFE).
- Program SEAL II. Transient, rough, ElastoHydrodynamic Lubrication analysis, mechanics and performance analysis of elastomeric, reciprocating seals
- Program EHL highly coupled with Abaqus software. Solution of the ElastoHydroDynamic problem for hydraulic and pneumatic seals with Newtonian and Non Newtonian fluids under transient conditions.

Internship Engineer

- 2014** - **Modeling of phase change materials (PCM) for high temperature energy storage** (Abengo solar- I2M Bordeaux)
- 2013** - **Thermal and dynamic study of the turbine blade** (Thermo-fluid laboratory)
- 2012** - **Gas turbine technology development** (Company: Sonatrach-Total-General Electric)
- 2012** - **Study and design of a solar tracker panel** (Thermo-fluid laboratory)
- 2011** - **Comparative study of the performances of two cycles Brayton-Joule cycle with a total power of 50MWe, one is closed with helium and the other is open to the air and is powered by solar energy at 400°C** (Company: Sonatrach-Sonalgaz-British Petroleum)
- 2010** - **Study of the drilling fluid behavior** (Company: Sonatrach-Total-Scchlumberger)

PROFESSIONAL SKILLS AND TRAINING

- Being able to work without close supervision, managing time and projects;
- Critical thinking; being able to evaluate a work, and making judgments about the value of information implied; drawing conclusions from data;
- Presenting work to peers and conferences, managing discussions, debating, defending a subject and an argument, having the confidence to put forward ideas to senior staff;
- Editing a document in a certain format, and exposing the ideas in a structured way;
- Designing a machine to be able to fulfill technical and functional specifications in order to measure;

As a teacher, I put in practice and extended skills during university teaching training like:

- Supervision of Bachelor projects
- Increase my skills in fundamental sciences (mathematical, mechanic and physics).

INTERNATIONAL CONFERENCES

- Experimental study of friction in pneumatic seals «A Azzi, A Maoui, A Fatu, S Fily, D Souchet - Tribology International, 2019 ».
- AZZI, Abdelhak. Étude théorique et expérimentale des systèmes d'étanchéité par joints pneumatiques. 2019. Thèse de doctorat.
- Patent "Test Set for the Evaluation of Energy Converter Parameters (hydraulic and pneumatic systems)".
- Peer reviewing papers for scientific journals and conferences (Tribology international (Elsevier))

Conference STLE, Mai 2016, Atlanta, USA

- Numerical simulation of surface roughness effects on the mixed lubrication characteristics of hydraulic seals «A. AZZI, A. FATU, D.SOUCHET, A.MAOUI, D. FRIBOURG ».

Conference WTC, September 2017, Bejin, China

- Experimental study of friction in pneumatic seals. «A. AZZI, A.MAOUI, D. FRIBOURG, A.FATU, D.SOUCHET ».

Conference Leeds-Lyon, Septembre 2018, Leeds, UK

- Transient modeling of reciprocating seals. « A. AZZI, A. FATU, D.SOUCHET, A.MAOUI, D. FRIBOURG ».