

Badreddine Barki

R & D MECHANICAL ENGINEER · FEA · COMPOSITES · CAD

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PROFESSIONAL SUMMARY

Mechanical Engineer with comprehensive experience in CAD modeling, finite element analysis, and developing innovative solutions for complex projects. Passionate about enhancing product quality and operational efficiency, with a strong track record of implementing successful design strategies and optimizing processes.

WORK EXPERIENCE

SLB Group — Abbeville, France MAR 2022 — JUL 2025
RESEARCH & DEVELOPMENT MECHANICAL ENGINEER

- **CAD design (SolidWorks/Creo):** designed and modeled 50+ complex special-machinery assemblies under welding and manufacturing constraints.
- **FEA simulation (Ansys/Abaqus):** ran structural, vibration and fatigue simulations — -15% mass, +25% structural strength.
- **Testing & prototyping:** supervised workshop assembly and physical testing, cutting non-conformity costs by 18% through early defect correction.
- **Project management:** authored functional specifications and detailed CDC requirements, cutting design cycles by 20%.
- **Mechatronics integration:** selected components, actuators and sensors with automation engineers (+10% system precision).
- **Regulatory & PLM:** wrote compliance dossiers (Machinery Directive, CE marking) and managed product lifecycle in Windchill.
- **Procurement & negotiation:** qualified suppliers and negotiated pricing, securing €80k savings on a major project.
- **Continuous improvement:** applied DFMEA/RCA methods and qualified critical components, cutting procurement costs by 15%.

Sigma — Clermont-Ferrand, France MAR 2021 — SEP 2021
R & D MECHANICAL ENGINEER — INTERN

- **SHM project:** predictive-maintenance solutions using embedded sensors (+25% system monitoring, -15% maintenance costs).
- **Signal processing:** developed vibration-analysis scripts (MATLAB/Python), speeding up engineering studies by 30%.
- **Multiphysics FEA:** structural and sensor-placement simulation in COMSOL/Ansys to optimize sensor performance under load.

TECHNICAL SKILLS

SOFTWARE & SIMULATION

SolidWorks	Creo / PTC	CATIA V5	
Siemens NX	Inventor	AutoCAD	
Abaqus	Ansys	COMSOL	RDM6

MECHANICAL ENGINEERING

Mechanical design	FEA	
Structural analysis	CAD/CAM	
3D modeling	Machining	CNC
Additive mfg.	Metrology	
Windchill PLM	FMEA/DFMEA/RCA	

MATERIALS & PROCESSES

Composites	Materials science	
Polymers	Rheology	Foundry
Forming	Design of Experiments	

ELECTRICAL & SENSING

Fiber-optic sensors	Sensor design
Analog/digital electronics	
Power electronics	Automation

PROGRAMMING

Python	MATLAB	C/C++	Java
Machine Learning			

LANGUAGES

French	Professional (C2)
English	Professional (C2)
Arabic	Native

CERTIFICATIONS

Agile Project Management	2023
Data Science & Analytics	2022

MECHANICAL ENGINEERING INTERN

- **Reliability engineering:** analyzed conveyor-belt wear dynamics to optimize preventive-maintenance cycles and reduce downtime.
- **Quality control:** validated geometric tolerance specs and audited supplier parts, reducing defect rates by 20%.
- **Root-cause analysis:** applied AMDEC/FMEA methods and drafted standardized corrective-maintenance instructions.

EDUCATION

Master's in Mechanical Engineering

University School of Physics and Engineering — Clermont-Ferrand, France
SEP 2020 — JUN 2022

Specialization: Materials, Structures, Reliability and Machinery. Thesis: FEA model for a carbon/epoxy composite wireline cable.

Engineering degree — Product & Process Industrialization

National Higher School of Arts and Trades (ENSAM) — Meknes, Morocco
SEP 2015 — JUN 2020

Industrial and mechanical engineering, manufacturing processes, automation and industrial management.

Fiber Optic Sensors 2021

FEA Abaqus — Composites 2021

SOFT SKILLS

Analytical thinking

Problem-solving

Communication

Teamwork

Time management

Cross-functional leadership