

# Project description

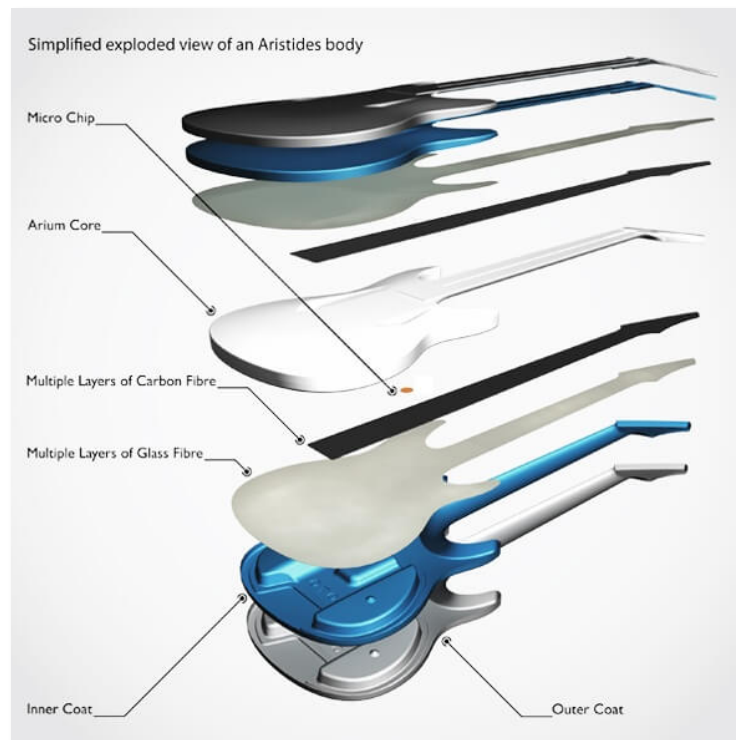
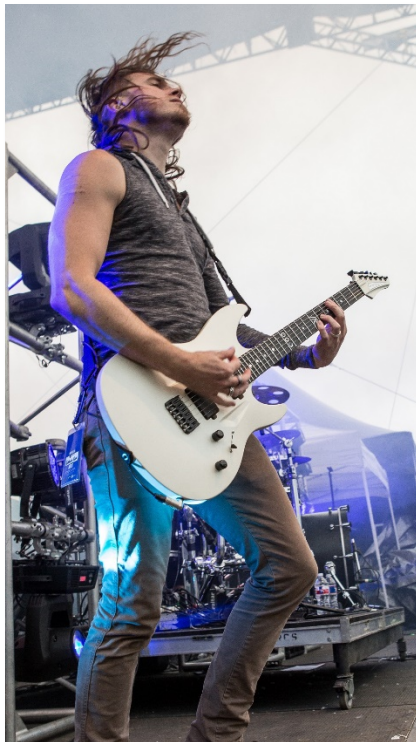
Development of a sound prediction test method for the use of composite guitar manufacturing, graduation

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## Background

Composite guitars have the advantage to be stable and give a consistent quality. But they don't necessarily sound great. Aristides Instruments spent the last 25 years developing the core material 'Arium' together with the skin reinforcements and other production techniques in order to get a great sounding guitar that always performs regardless the climate influences like temperature and humidity fluctuations.

The chosen materials and production techniques are based upon years of experience and field testing. Needless to say this costs a lot of time. For future material development we're looking for a workable analytical method to test new sample materials and predict their effect on the acoustic properties of the guitar in an early phase of the development.



## Project description

The goal of this project is to develop an – easy to use - testing method to investigate the influence of different composite materials on the overall sound characteristics of a guitar. This allows us to test more efficiently in the future before building complete guitars.

Your work will contain research in the interesting fields of composite materials, acoustics, tribology and engineering of the test setups.



## Activities

This graduation project is a chance to dive into the world of composite materials and their mechanical and acoustic properties. You'll research both composite materials and mechanical/acoustic analytical methods in an lab- and production environment. In the end we expect an easy to use test method which is built by you. The following activities are expected:

- Researching existing analytical methods to test and predict their effect on the acoustic properties of the guitar.
- Developing a sound prediction test method to test composite materials.
- Building a prototype.
- Testing different materials and implement them into our current production method.

## Scope of work

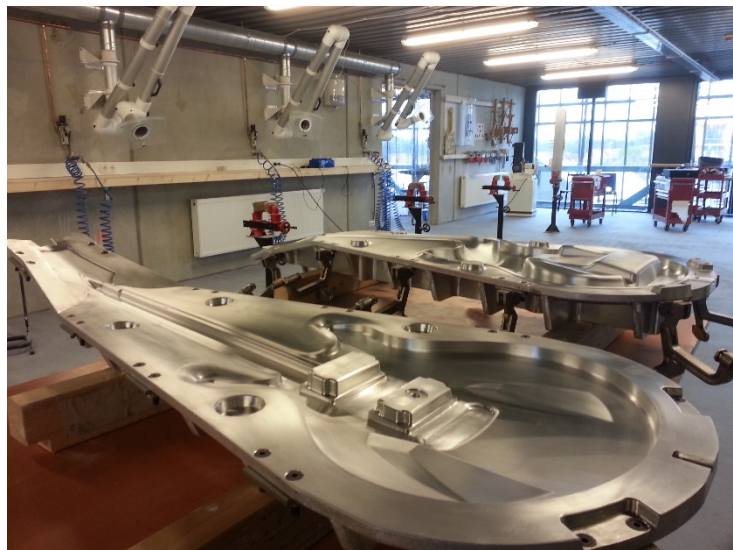
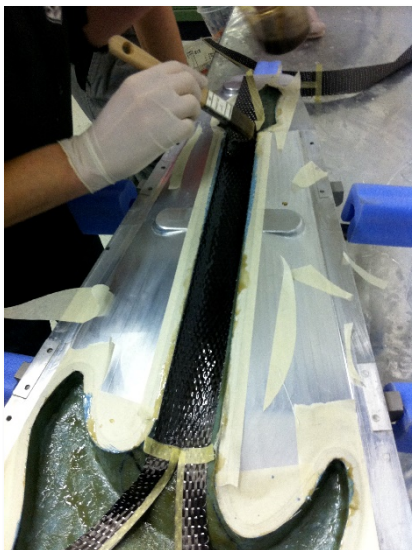
- Project plan, research questions, research method
- Literature study, research on existing methods, acoustic variables and common problems etc.
- Functional analysis and concept study
- Concept design / Detailed design
- Demonstrator for verification and validation
- Testing of the system
- Analysis of test results
- Communication and interaction with stakeholders, company and experts
- Technical report

## Company information

Aristides Guitars located in Haarlem develops, produces and sells composite electric guitars for the world market. Aristides consists of 15 young men trying to build one of the best performing guitars out there.

During the last 10 years we've earned ourselves a name in the high end guitar business. And because quality is of the highest priority almost all facets of the production are done in house. This is where craftsmanship, creativity and new composite techniques come together.

And we're constantly improving.



**Additioneel:**

**Locatie:**

Aristides en in Composieten Lab

**Ideeen:**

- 1) Opstelling: Mechanisch dynamische analyse (MDA).
- 2) Opzetten eindige elementen model (FEM model).
- 3) FEM model input geven uit resultaten MDA.
- 4) Kalibratie meetmethode op basis van huidige materialen.
- 5) Zijn er wellicht andere methodes. Zoeken op 'resonance acoustic spectroscopy'.

