



Master Thesis

Fatigue behaviour of thin walled steel structures

Background:

Thin walled corrugated structures such as flexible joints are used in a variety of safety applications with long-term reliability requirements. Depending on the application type the joints might be subjected to high cyclic loads leading to their failure due to mechanical fatigue. Thus assessment of their high fatigue properties under suitable loading conditions is required for design optimization and proper material selection. Conventionally the fatigue tests of such structures are conducted at low or moderate testing frequencies.

Project goals:

In the frame of an industrial project a specially designed high frequency, time saving dynamic set-up has been developed as a prototype. This system shall be applied for **characterization of the fatigue properties** of selected thin walled steel samples. The **design of the system should be improved** in cooperation with the project partner. Lifetime curves shall be obtained at different testing conditions. Microstructural investigations and a subsequent failure analyses of the samples allows to gain insights into the encountered mechanisms of fatigue. Furthermore, the effect of testing frequency on the lifetime of the tests structures will be assessed based on a comparison of the obtained data with those available from the conventional fatigue tests.

Requirements:

- BSc in preferably mechanical engineering, materials science, technical chemistry.
- Previous experience in material testing
- Good written and verbal communication skills in English and German

Dates and salary:

Start: January 2021 for a duration of 6 months.

400€/month

Applications to:

Golta Khatibi, Institute for Chemical Technologies and Analytics, TU Wien, Getreidemarkt 9/164, email: golta.khatibi@tuwien.ac.at

David Beck, VAT Vakuumventile AG Seelistrasse 1, 9469 Haag Schweiz
email: da.beck@vat.ch