



**Adaptive clamps for machining  
of thin-walled components**  
**Suppressing vibrations &  
measuring the process**



smart

advanced manufacturing

## ORGANISATION PROFILE

Insert brief description of the leading organisation: Name, Personnel, Size, Products/Services/Technical areas and R&D project expertise.

- KTH Royal Institute of Technology, School of EECS, has grown to become one of Europe's leading technical and engineering universities, as well as a key centre of intellectual talent and innovation. We are Sweden's largest technical research and learning institution and home to students, researchers and faculty from around the world. Our research and education covers a wide area including natural sciences and all branches of engineering, as well as architecture, industrial management, urban planning, history and philosophy.

## ORGANISATION PROFILE

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- Brogren Industries is an experienced technological company where process control and quality assurance are key factors. The core values of productivity, quality and development make up a legacy that assures Brogren will continue lead the industry in specialized machined parts, while working towards a long-term relationship with every customer.
- Saab Aeronautics is an innovative supplier of world-class aircraft systems and is engaged in research, development and production of military aircraft systems. It also conducts studies as preparation for future manned and unmanned aircraft systems and the development of existing products. Collaborations with other world-leading entities, both large and small, is a success factor.
- GKN Aerospace is the original aerospace innovator. For decades, GKN Aerospace technologies have inspired and industrialized the aerospace industry, combining engineering excellence and technology leadership. GKN Aerospace's operational excellence and high-volume production capabilities are now driving the global development towards more automation, higher performance and smart industry solutions. The result is shorter production lead times and more affordability for our global customers.

# PROPOSAL INTRODUCTION (I)

**Vision:** main project goal

- Design of a new type of clamp with a smart workpiece interface. This interface senses clamping pressure and induces damping in the structure.

**Motivation:** why the project is necessary

- Manufacturing of thin-walled components requires long machining times. This is due to expensive setups, frequent quality inspections and an increased sensitivity to deviations and vibrations. The solution to sustain productive machining and repairing is a combination of simulation tools as well as adaptable and reconfigurable clamping systems.

**Content:** which are the developments to be made in the project

- Modular clamping system
- Integrated vibration suppression actuator
- (Data-driven) Models for interface clamping pressure and machining conditions

## PROPOSAL INTRODUCTION (II)

**Expected outcome:** descriptions of the results to be obtained in the project

- Cost-effective modular solution for the clamping of complex workpieces
- Increased machining productivity as less vibrations occur with higher damping during machining
- In-situ process monitoring machining allowing to adapt the process

**Impacts:** what will be the expected market impact of the project

- Increased productivity and in-situ monitoring allow for less scrap at higher throughput.
- Decreased vibrations also enable higher geometric machining accuracy and better surface finish.

**Schedule:** start and end dates for the project. Duration.

- Start: 2021 – 01 - 04
- End: 2023 – 01 – 04
- Duration: 24 Months

## PARTNERS

**Current Consortium:** list of partners already involved in the project

- KTH Royal Institute of Technology
- GKN Aerospace
- Saab Aeronautics
- Brogren Industries

**Partner search:** type of partner searched and countries of origin (if necessary).

- Industry and academia
- AI specialists / data-driven modeling
- Vibration specialists / actuation / sensing
- Clamping solution / design
- Applicants

## CONTACT INFO

**Contact info:** of the person coordinating the project proposal

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