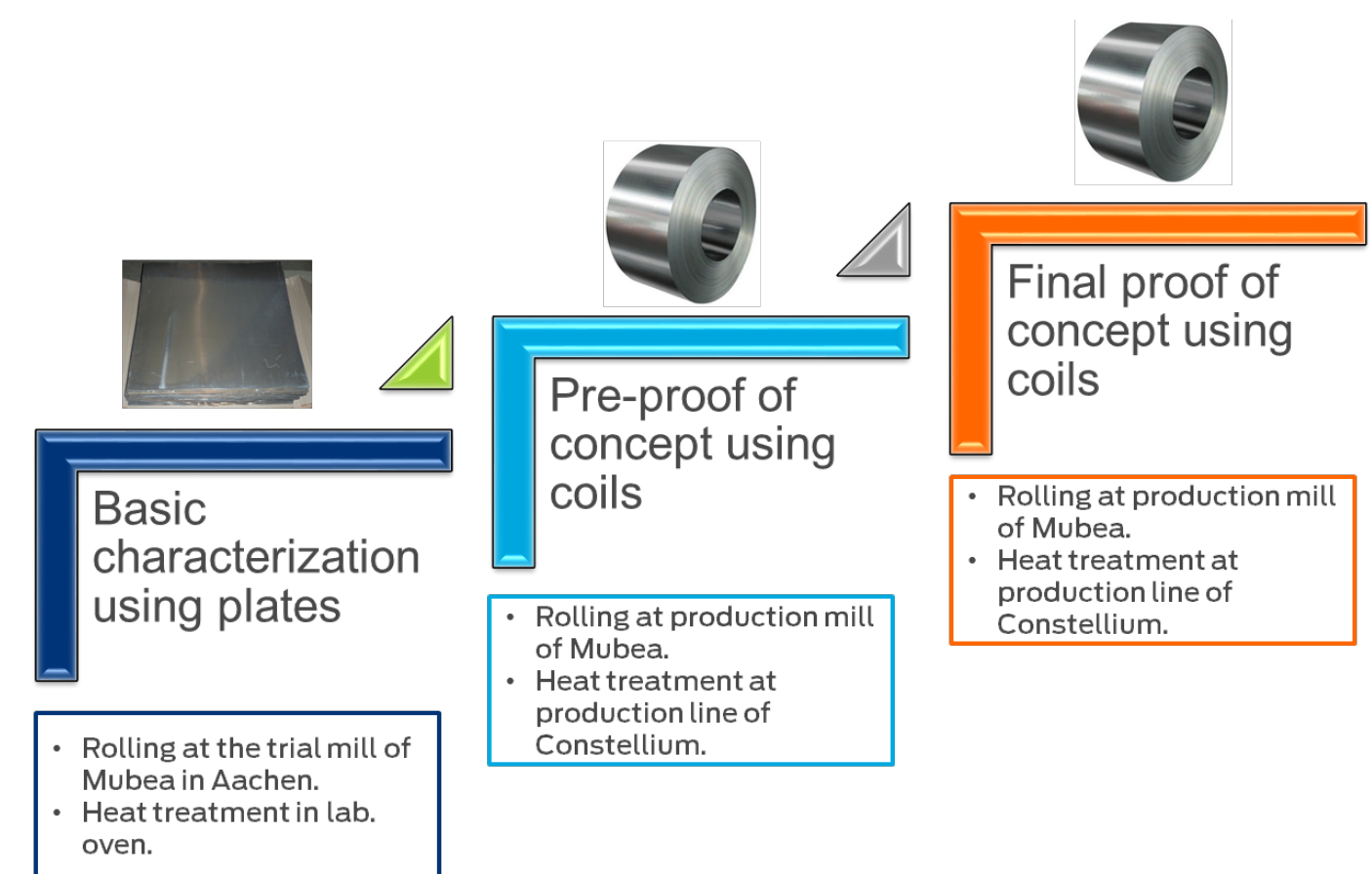


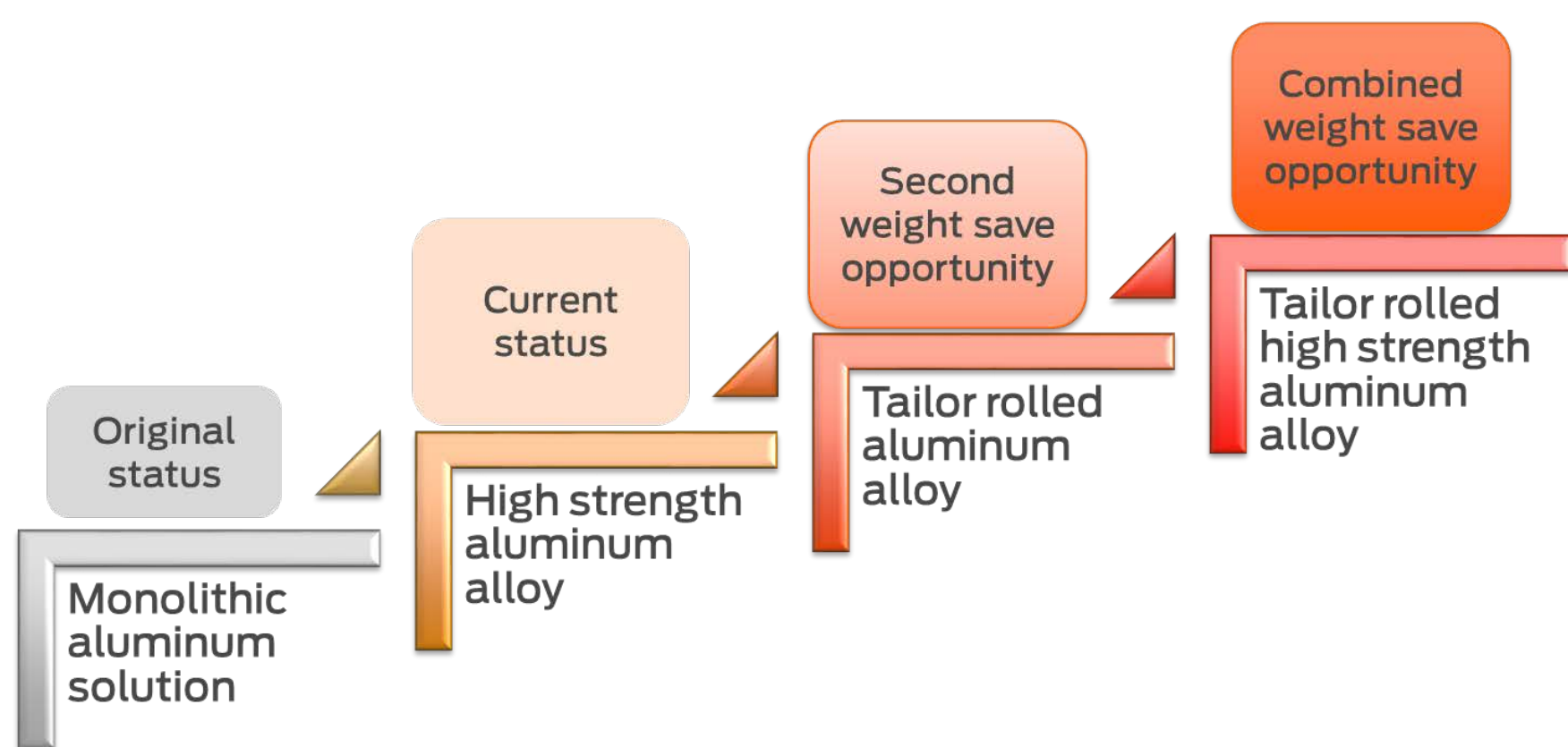
Motivation

The usage of Aluminum alloys in the automotive industry has significantly increased in recent years leading to a substantial weight reduction. This weight reduction trend has to be pursued through additional lightweighting technologies. Tailor Rolled Blanks (TRB) offer an interesting solution by an adequate thickness distribution through the blank allowing an optimized usage of the weight where it is requested. This technology is however today restricted to steels. The industrial feasibility of TRB with high strength Aluminum alloys needs to be demonstrated. In particular the solution heat treatment phase which is necessary to guarantee final properties needs to be validated.

In order to develop the TRB technology for high strength Aluminum Alloys, a three step approach is adopted. The first step is based on tailor rolled blanks processed at a trial rolling mill at Mubea. The related subsequent steps are then all performed in lab conditions. This first step allows gaining insight on the technology and optimizing process parameters. The second and the third steps allow the pre-proof and final proof of concept and are performed on coils at industrial scale.



Development Approach



Stair-case approach to enable lightweight through tailor rolling of high strength aluminum alloys

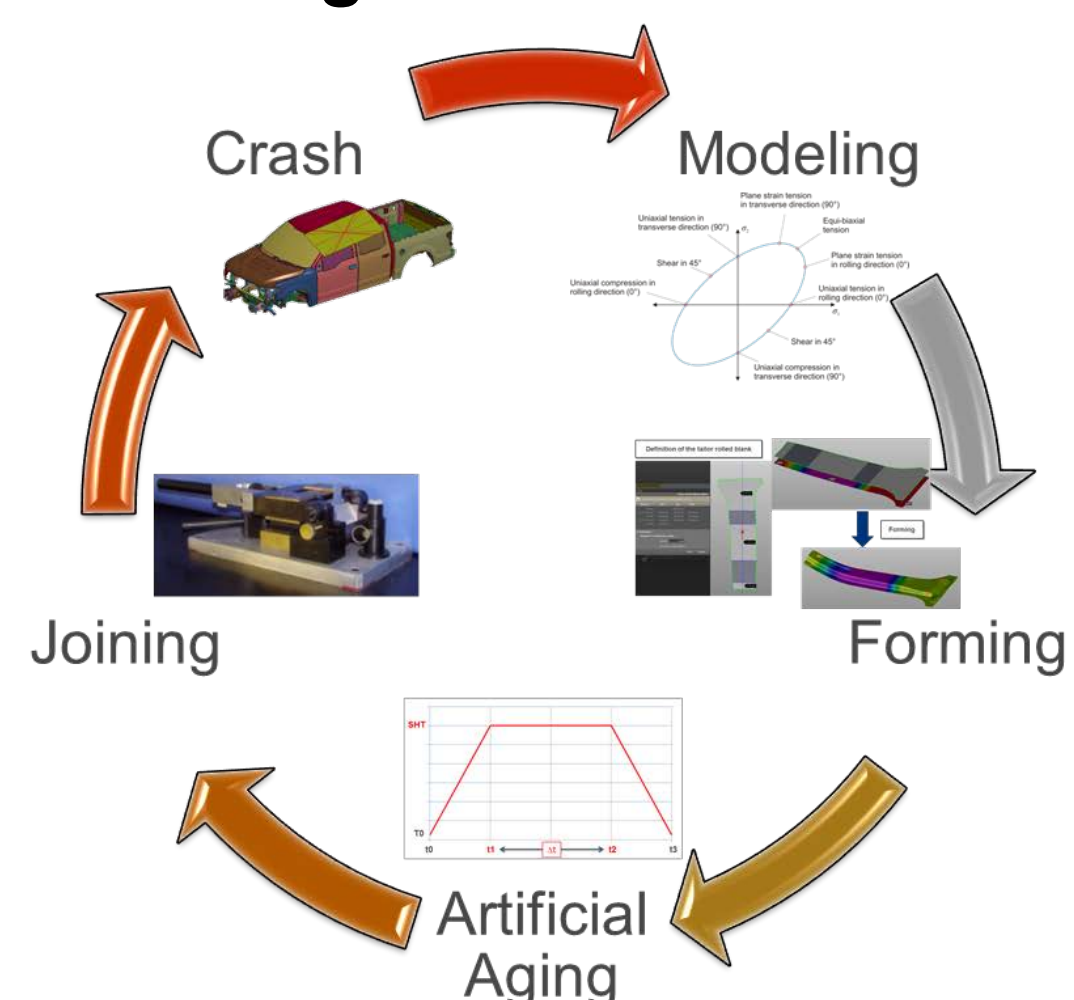
Project goal

The goal of the project is the development of an industrial solution to produce tailor rolled blanks for structural body components made of high strength Aluminum alloys. Material properties should be compliant with Ford specifications. In this project all process steps leading to the manufacturing of Aluminum-TRB components will be verified for feasibility. One critical process step is the solution heat treatment which will enable formability, joinability and ensure required final properties.

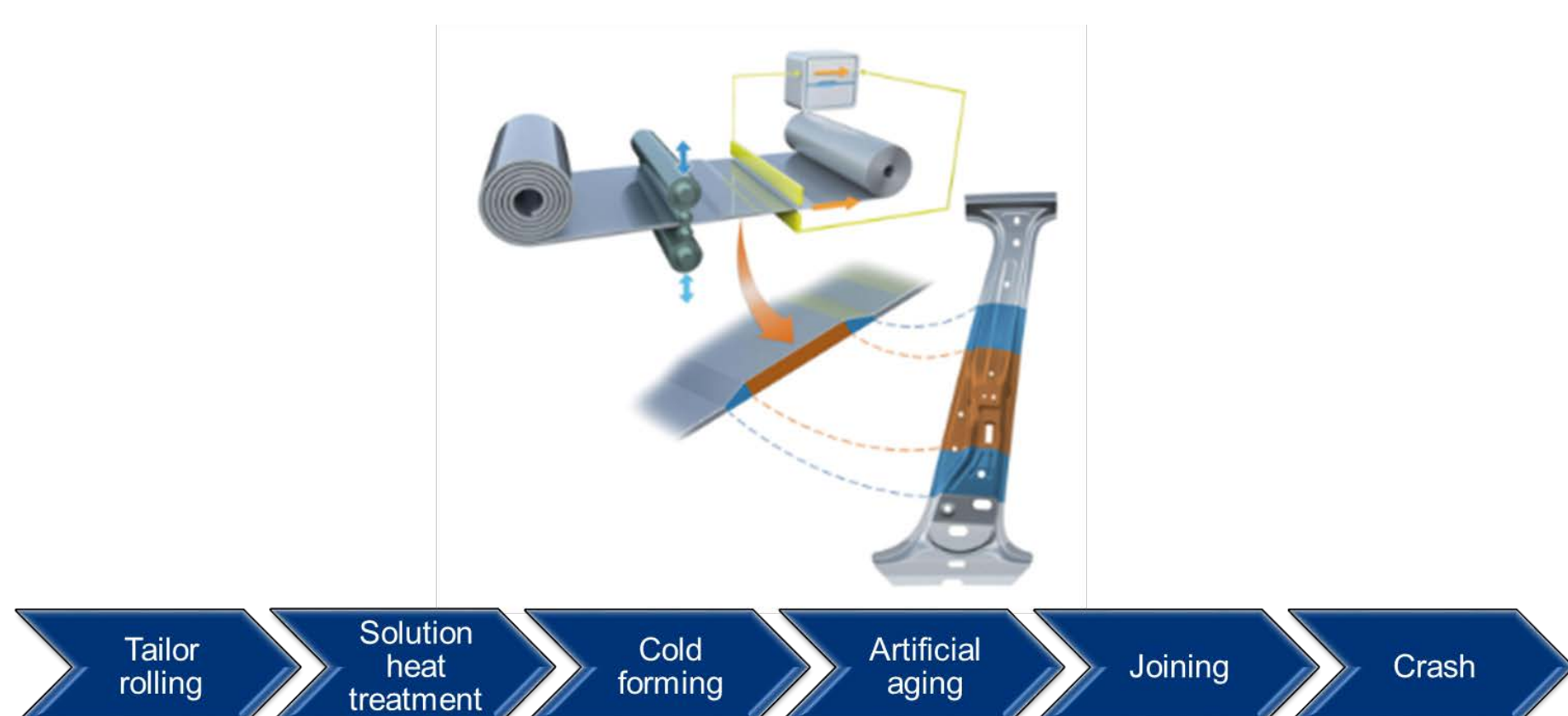
Project organization

Partners in the project are Constellium, Ford and Mubea. Work packages were defined and each partner contributes to the project based on its competencies and available resources. Constellium is in charge of the incoming material of the final solution heat treatment process and provides its expertise in developing high performance structural alloys. Mubea is responsible for the tailor rolling and all related aspects. Ford leads all forming, joining and application related topics. The RWTH Aachen University is made to contribution through individual projects in order to contribute to reaching specific milestones.

Technical challenges



Project partners



Process chain for tailor rolled high strength aluminum alloys