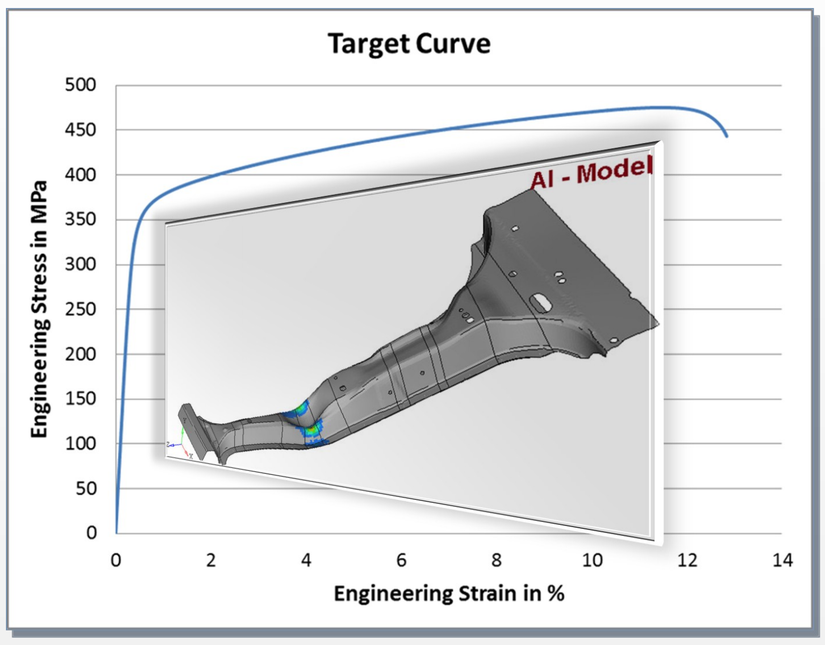
Project UHSA

Ultra **H**igh **S**trength **A**luminium for mass production

AMAP Advanced Metals and Processes



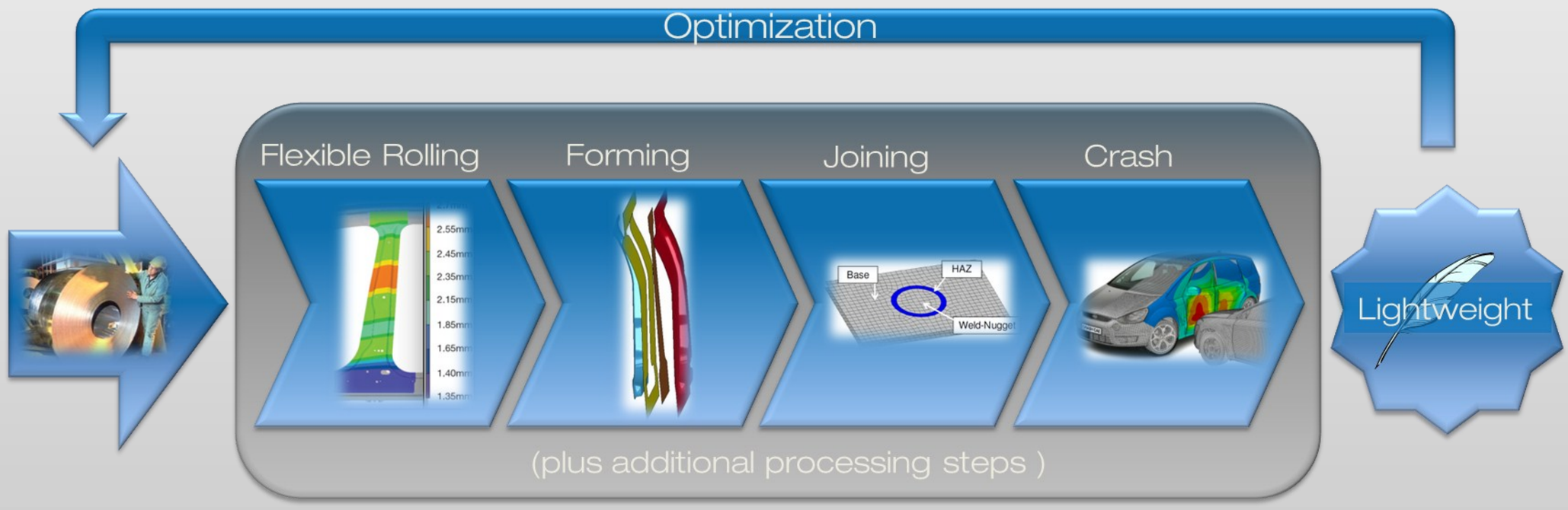
Simulation-based assumption of the aimed strength level

Ultra High Strength Aluminium (UHSA) alloys provide a high lightweight potential for structural body-in-white parts. Weight savings up to $\Delta m \approx 40\%$ of current steel designs are possible (simulation-based assumption).

To enable the use of UHSA-alloys in body-in-white construction, advanced manufacturing processes are required.

Aim of the AMAP Project "UHSA" is the development of a process chain "from sheet to part" suitable for mass production. Furthermore joining concepts for structural joints as well as CAE tools for an integrated manufacturing and crash simulation will be developed.

Process Chain



WP1 - Process Chain

- Selection of Al-alloys
- Process optimization
  - flexible rolling
  - forming
  - heat treatment
  - surface treatment

WP2 - Joining Concepts

- Development/optimization of joining technologies suitable for mass production
- Development of a joining concept for structural joints
- Development of CAE tools for the process simulation of joining technologies to predict joint strenght

WP3 - CAE Tools

- Development of CAE tools for process chain simulation
  - flexible rolling → forming
  - forming → crash
  - joining → crash
- Part/demonstrator design
- Assessment of lightweight potential

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