The GFM SKK10/R radial forge will be used as the AFRC testbed. The machine is a reinforced version of the standard SKK10 and can forge parts with max starting diameter of 125mm down to 25mm on a wide range of different materials. Max forging force is 150tons. Parts can be forged from room temperature up to 1200 deg C.
**Test Geometry**
For demonstration and machine capability studies the AFRC uses a standard preform to produce a forged shaft typically used in the automotive sector.

![Preform and Forged Part](image)

Photo above shows the forged part produced from a machined preform. Preform length is 70mm and forged part length is 220mm.

**Oscilloscope Outputs**
The machine is equipped with a 128-channel oscilloscope integrated into the 5-axis GFM machine NC-controller for simultaneous recording of machine outputs. Measurements include forging force, speed & position of axes and workpiece temperature. A summary of the some of the main measurements is given below:
1) Measurement of axes travel using SSI encoder or incremental encoder. Encoder signals processed with sub-prints TIP 114-10R or TIP 119-50R (on TVME 200-10R cards). TEMPOSonic measuring system used for A, B, D & DB axes

2) For hammer axes (R&L), Multiturn encoders are used

3) Forging power motor – value measured using active power measuring transducer (0-20Ma WITH 1a/400vac current transducer 200/1A)

4) Forging force – actual value measurement strain sensor (4-20mA)

5) Forging box temperature – actual value measurement with PT100 temperature sensor

6) Workpiece rotation – actual value measurement using incremental encoder (2500 pulses/revolution)