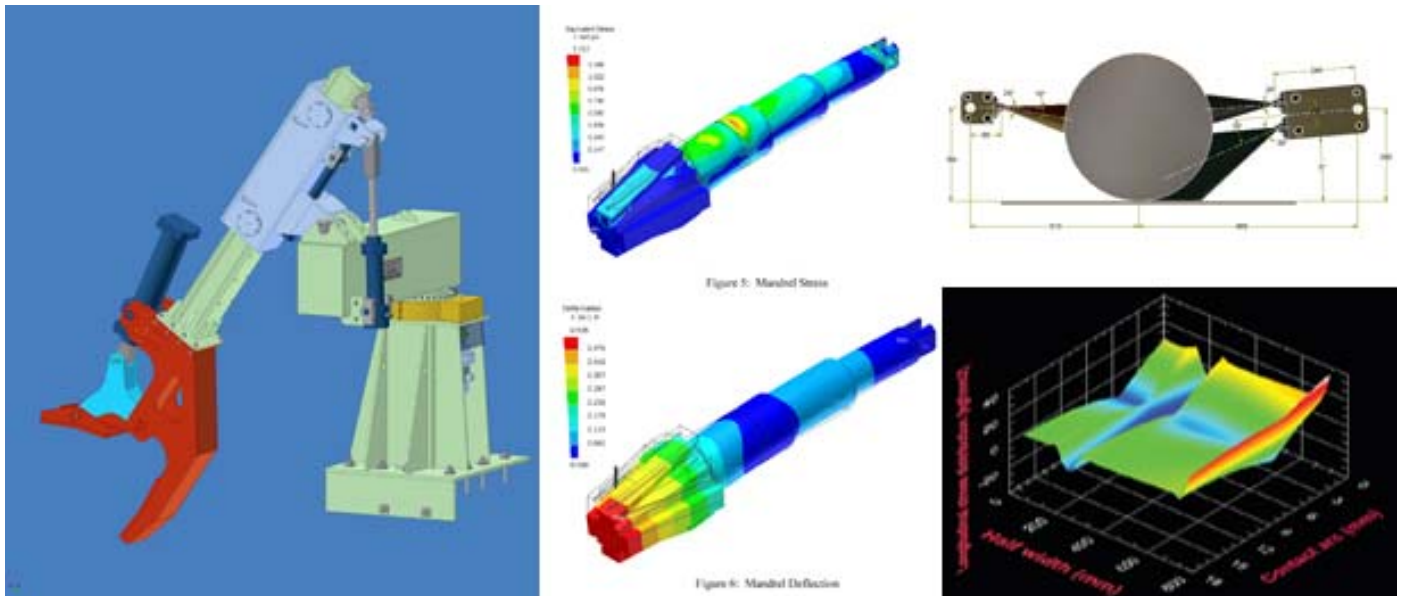


# Research & Development

Quad Engineering has an ongoing commitment to Research and Development (R & D). Quad management believes that constantly developing and researching new ways to improve process modeling, design methods and equipment design is key to maintaining Quad's strong reputation as a leader in process design and equipment supply to the metals industry.

R&D has allowed Quad to successfully undertake many projects where new processes are required, and where no previous references existed. Quad has worked extensively with NRC (National Research Council of Canada), in R & D projects. Quad has an in-house laboratory, which includes an 8" model rolling mill, heating furnace, as well as sophisticated software and simulation tools. Quad has also used NRC's laboratory mills for additional testing. Some R & D projects have also been done with industrial partners to ensure that 'real life' conditions are tested.

Quad's R & D group comprises a number of senior specialists (including four permanent staff members with PhD's), who have extensive experience in the metals industry.



Some examples of Quad's R&D projects include:

- Physical Modeling of sheet pile, super-light wide beams and track shoe sections
- Development of new process for producing Titanium Billets.
- New Process and Equipment for elimination of ridge buckles.
- Development of advanced 3-D simulation tools for hot and cold rolling.
- Advanced modeling for Hot Strip Mill run out table cooling.
- Customized equipment solutions for melting and rolling.