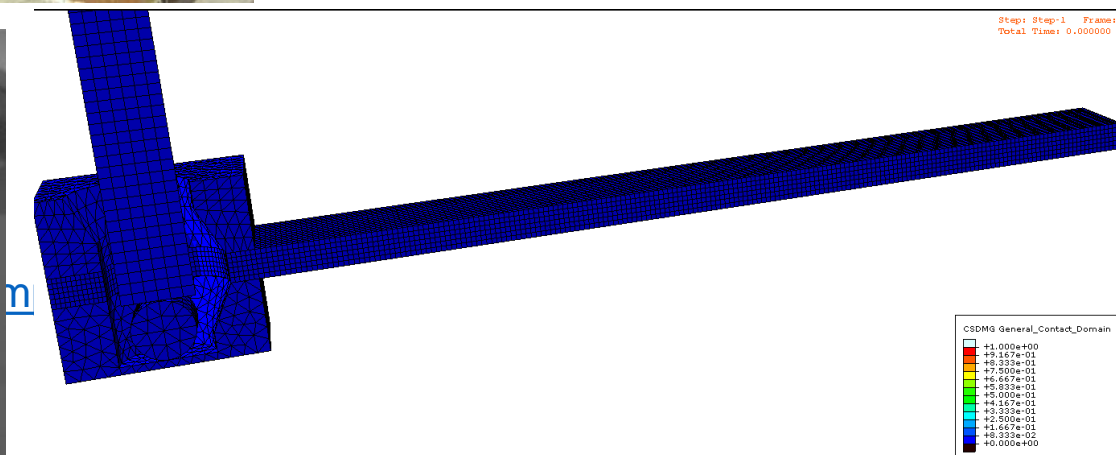
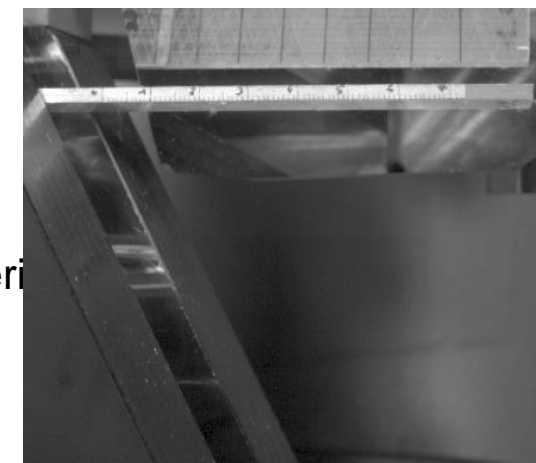
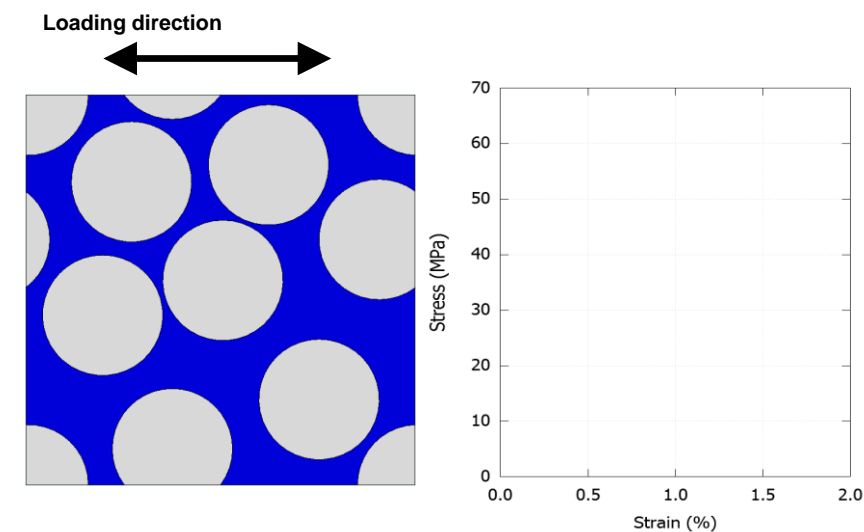
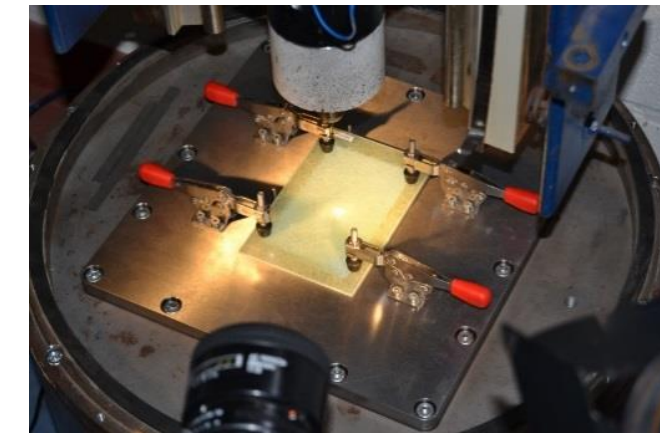
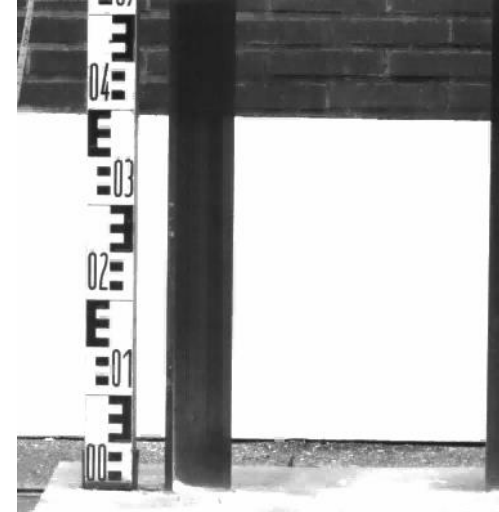
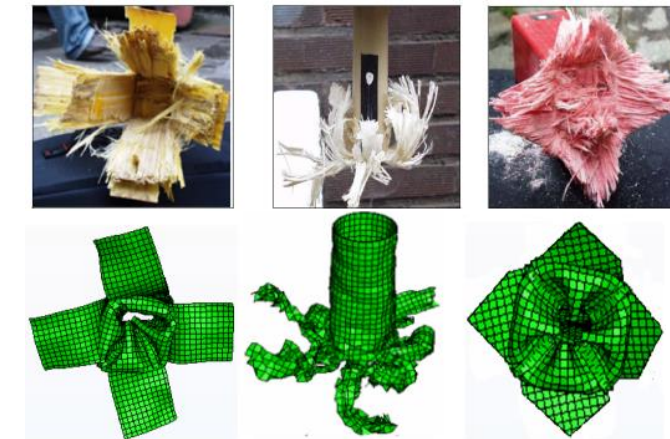
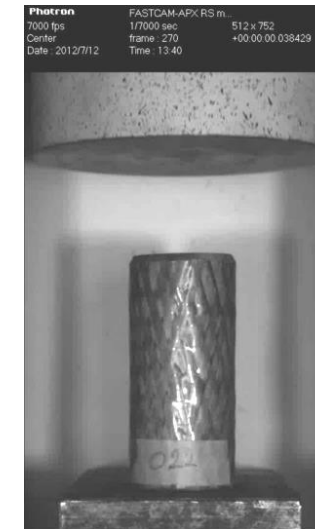


KEY AREA 1 > IMPACT OF COMPOSITES

Crush / crash / crashworthiness

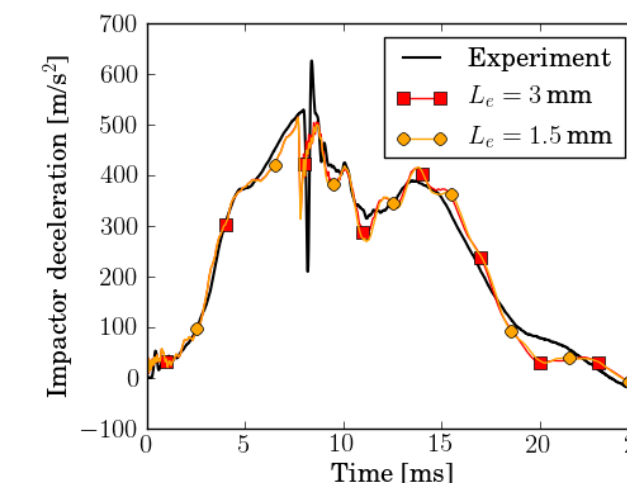
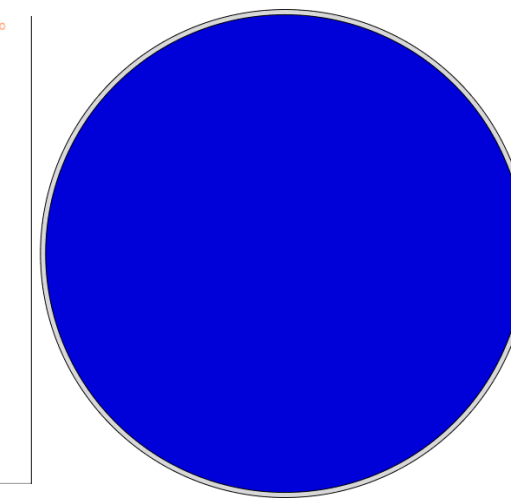
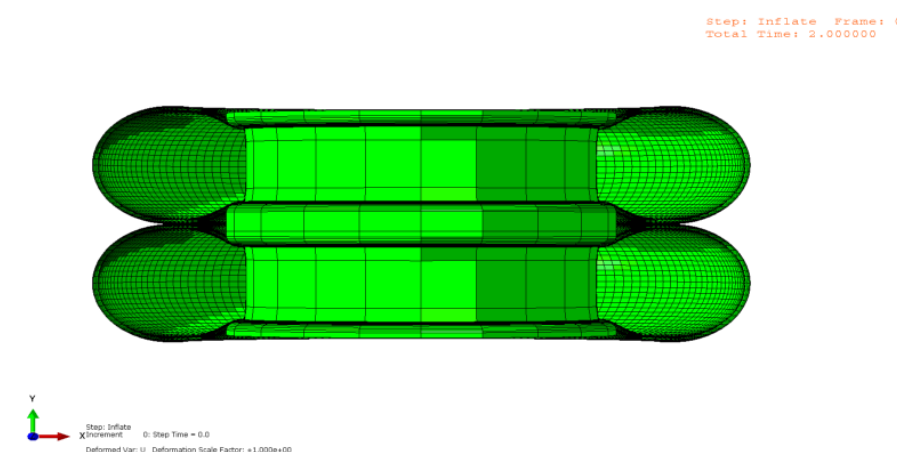
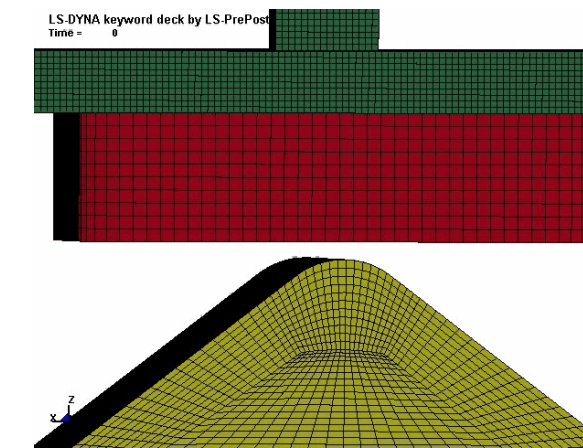
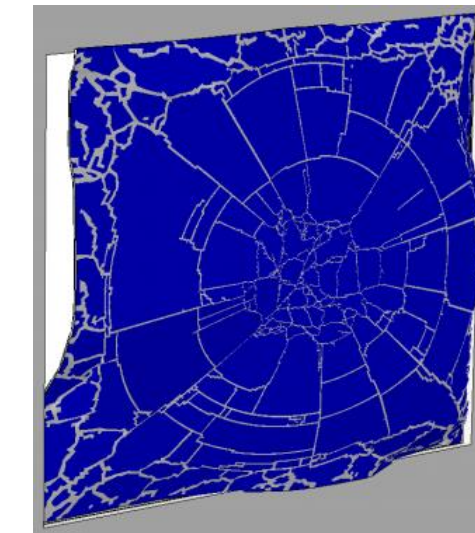
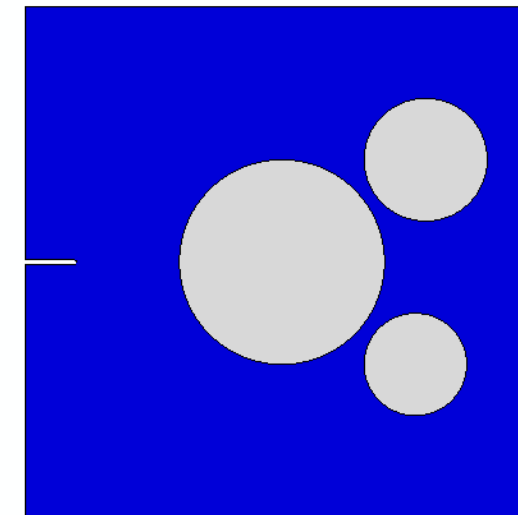
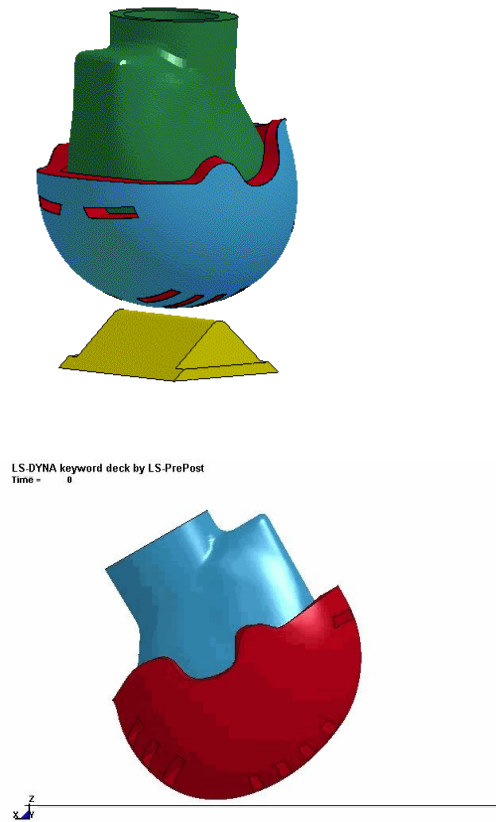
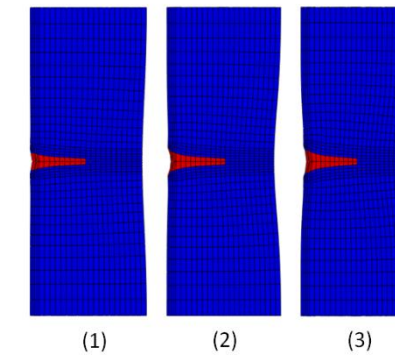
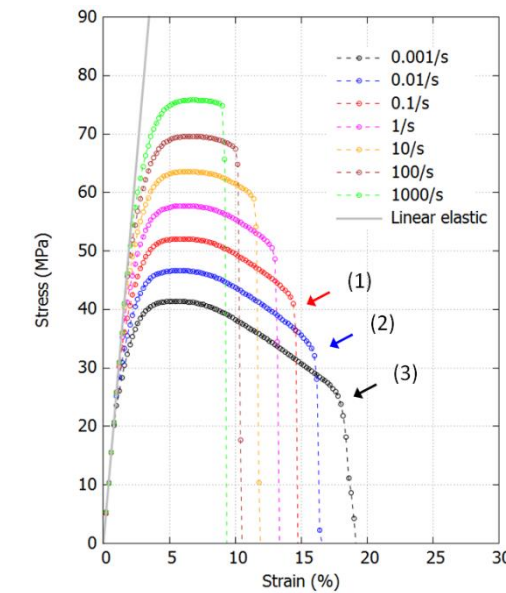
- Axial crushing of pultruded square and circular composite tubes -> correct simulation of triggering and energy absorption
- Design of lightweight hybrid composite bumper beams / pillars
- Characterization of strain-rate dependent tensile response of thermoset and thermoplastic composites
- Measurement of rate-dependent Mode I delamination growth and identification of rate-dependent cohesive laws
- Testing and simulation of low-velocity impact and Compression After Impact (CAI) of UD and textile composites
- Development of rate-dependent orthotropic damage models for impact damage in UD and textile composites
- Multi-scale modelling of strain-rate dependence and impact strength of textile composites (micro-meso-macro homogenization)



KEY AREA 1 > IMPACT OF COMPOSITES

Crush / crash / crashworthiness for other materials

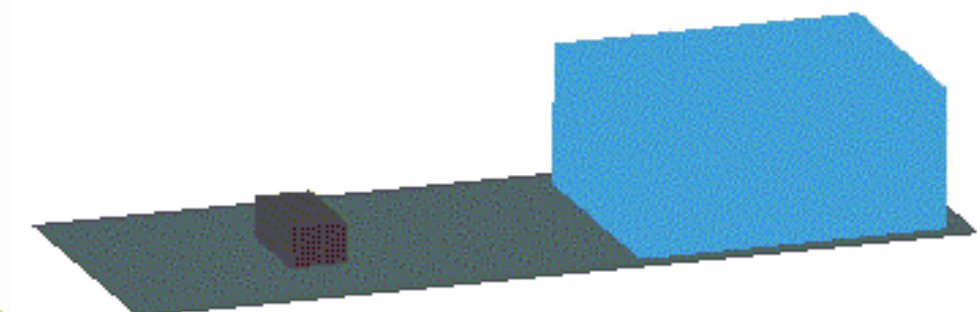
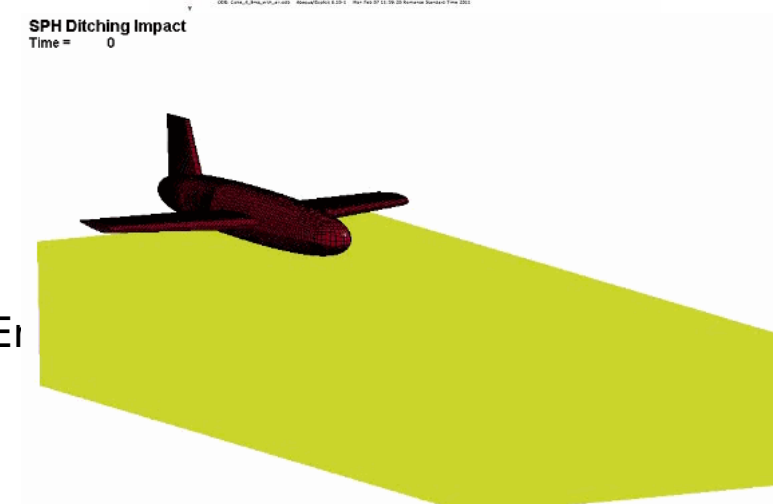
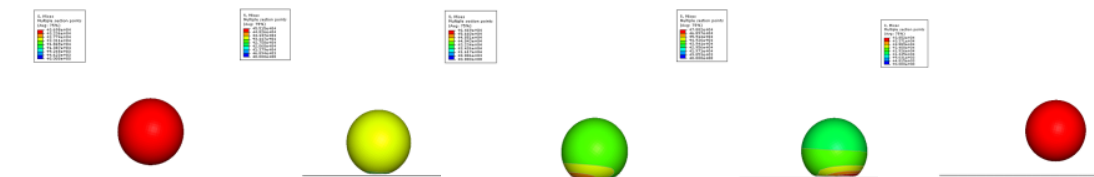
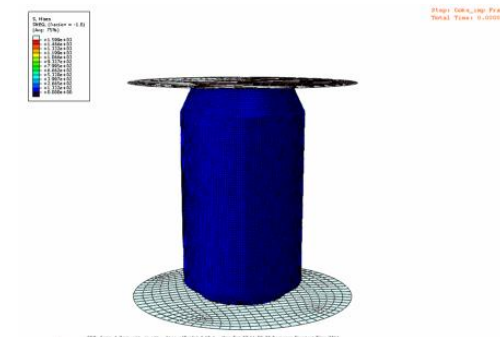
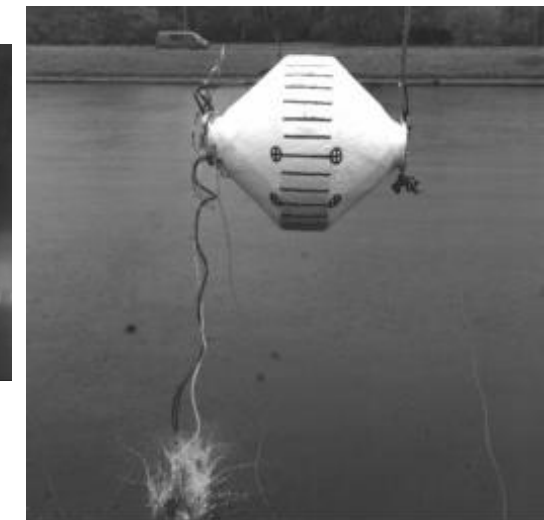
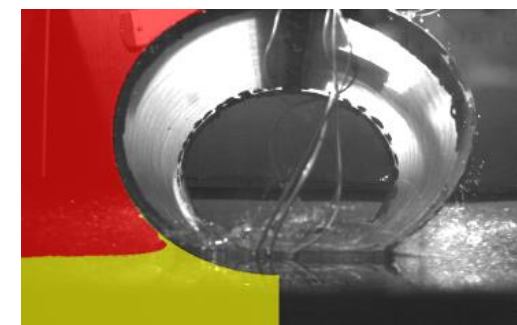
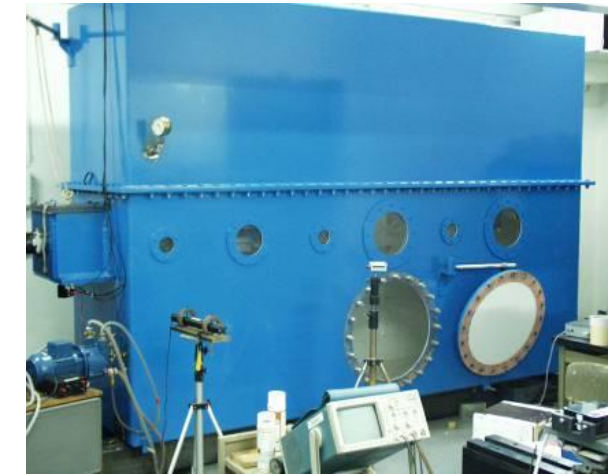
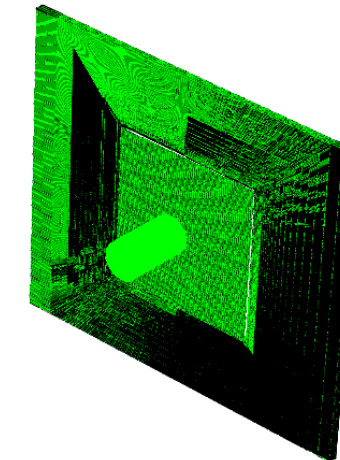
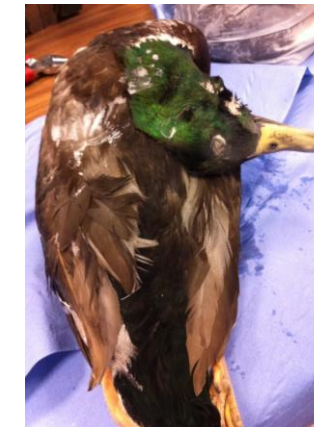
- Simulation of impact and energy absorption behaviour of EPS foams for bicycle helmets
- Dynamic fracture models for brittle and ductile polymers, including rate-dependence and crack branching
- Combined visco-plastic/damage/fracture material models for polymeric materials
- Strain-rate dependent hyperelastic models for soft polymer interlayers in laminated glass
- Directional brittle smeared cracking models for glass
- Testing and modelling of (reinforced) rubbers for tyre applications



KEY AREA 1 > IMPACT OF COMPOSITES

Special impact types

- Simulation of bird strike with SPH and CEL techniques
- Bird strike tests with gelatine replicas and real birds on rigid and deformable targets (multi-axial force and momentum measurement !)
- Testing and simulation of bird strike impact on booster vanes of aircraft engines
- Slamming and fluid-structure-interaction of deformable composite structures for wave energy applications
- Impact and blast loading of large laminated glass facades
- Blast loading of lightweight metal can structures (FEM simulation in ABAQUS + LS-Dyna)
- Simulation of interaction between football and artificial turf
- Ditching of aircraft on the water



KEY AREA 1 > IMPACT OF COMPOSITES

Equipment

- Three digital high-speed camera's (max. 250 000 fps), oscilloscopes, very fast data-acquisition boards
- Drop weight set-ups (2.5 m and 6 m) with dynamic load cell and accelerometer
- Low-velocity impact and Compression After Impact (CAI)
- Dynamic delamination test set-up
- High strain-rate hydraulic tester
- Charpy tests
- High-speed Digital Image Correlation

