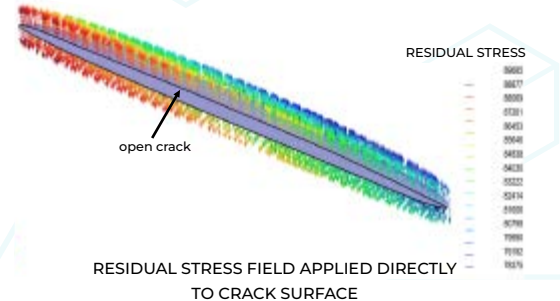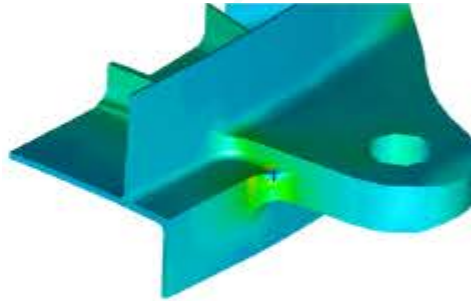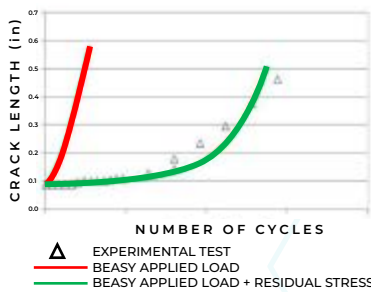# BEASY Fatigue Crack Growth Modeling

- Quickly develop fracture mechanics models of 3D components
- Determine accurate stress intensity factor solutions
- Use existing FE solutions to create BEASY fracture models
- Perform crack growth simulations in residual stress fields
- Surface treatment related stress fields, measured in the laboratory, can be used to inform BEASY models
- Perform damage-tolerant design assessments and failure investigations
- Reduce material and process development costs

BEASY APPLIED LOAD
BEASY APPLIED LOAD + RESIDUAL STRESS
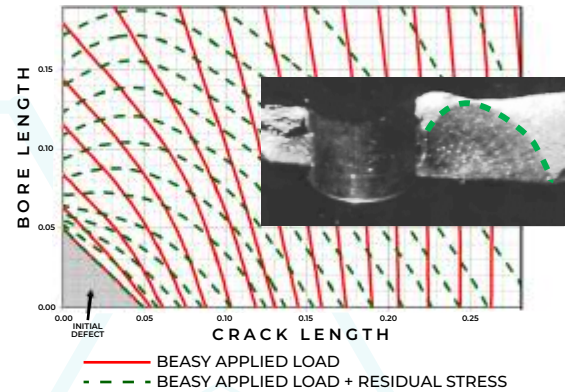
Testing validated simulations show that crack paths in residual stress fields are different

△ EXPERIMENTAL TEST
BEASY APPLIED LOAD
BEASY APPLIED LOAD + RESIDUAL STRESS

RESIDUAL STRESS

open crack

RESIDUAL STRESS FIELD APPLIED DIRECTLY TO CRACK SURFACE

ENGINEERED RESIDUAL STRESS DONE RIGHT WILL EXTEND FATIGUE LIFE. MODELING CAN QUANTIFY THE BENEFIT!

LAMBDA Technologies Residual Stress Testing

- Represents actual manufacturing process
- Rapid testing of all types of materials and part geometries
- High resolution incremental depth profiles and 3D stress field maps for assessment of residual stress gradients
- X-ray diffraction and mechanical measurement methods
- Extensive X-ray elastic constant library for over 300 materials
- Measurement of single or multiple stress components

LAMBDA's empirically determined residual stress field data drives the fracture mechanics simulations needed to assess the design performance of engineered structural materials

CONTACT US TO LEARN HOW USING LAMBDA'S MEASURED RESIDUAL STRESS FIELD DATA IN BEASY MODELS IMPROVES FATIGUE LIFE PREDICTION