



MCQ (Material Characterization & Qualification) - is a material modeling software providing engineers with advanced analytic tools to characterize and qualify material properties as input for finite element analysis. Starting with results of standard ASTM tests, fiber volume, density, resin content and void volume, MCQ reverse engineers in-situ constituent properties of fibers and matrix while taking into consideration manufacturing anomalies, effect of defects, complex architectures, effect of environment and scatter. Next MCQ reconstitutes the laminate (test coupon) and calibrates effective properties against test, utilizing standard and user defined failure criteria. In this manner, MCQ discerns between as-designed, as-built, and as-is material states to predict other design related outcomes, such as:

- ❖ laminate properties (thermal-hygral-mechanical-electrical)
- ❖ properties related to electrical conductivity, resistivity, and dielectric effect
- ❖ load limits and damage/failure modes
- ❖ parametric carpet plots
- ❖ -A and -B Basis Allowables
- ❖ material properties for 2D/3D fabric/weave/braided composite lamina/laminates.
- ❖ ABD and engineering constants used as input for commercial FEA solvers.

The MCQ suite of software consists of MCQ Composites, MCQ Chopped, MCQ Ceramics, MCQ Metals, and MCQ Nano. MCQ suite of software addresses continuous fiber, discontinuous fiber, ceramic matrix, metal matrix, and hybrid systems. MCQ supports a library of validated classes of composite materials in order to make better parts, better components and, ultimately, better solutions. Ultimately, MCQ facilitates material qualification, modeling, and design analysis so that, in a very short period of time, end-users can generate vast amounts of information concerning composite material system.

