Fiber and reinforced plastic compounds are finding their way into large-scale industrial production. The lightweight but sturdy fiber-glass and carbon-fiber reinforced plastics GFRP and CFRP are the materials of the future, especially in the automotive and aircraft industries. The high demands on material quality, proper machining, and the need for automated and thereby more economical production processes means that machine vision systems are gaining increasing importance.

Machine vision solutions from VITRONIC inspect the surfaces and contours of individual components and compounds after every relevant production step. This supports the additional automated handling of materials: not only do the systems determine the position and location of cuts, but at the same time they automatically verify their quality and geometry before further processing. This ensures the processing of a maximum number of good parts with the goal of zero-defects in finished parts.
Reels:
Automated inspection of reels against specified defect criteria before further processing prevents defective material being used in the further production process.

Cuts:
VITRONIC inspection systems check cuts for web faults and fiber orientation, which affect the rigidity of the finished compound.

CFRP/GFRP contour inspection:
Contour inspection of the cut edges of CFRP/GFRP cuts and bonded components for possible fiber fringes.

CFRP/GFRP surface inspection:
The surface inspection checks the bonded CFRP/GFRP component for defects such as holes, inclusions, and folds.

Robot vision:
Machine vision solution during automated handling for determining cut position, checking dimensional accuracy, and precise positioning.

VITRONIC GFRP/CFRP inspection at a glance:

» Automated surface and contour inspection of CFRP/GFRP cuts and bonded components after every relevant production step
» 2D/3D position determination and sizing of cuts for automated handling
» Plausibility inspection of cuts
» Integrated cut inspection as well as quality inspection of cuts

Integrated 2D/3D position determination and quality inspection
VITRONIC inspection systems provide an integrated and automated CFRP/GFRP inspection solution across the entire production process from reel all the way to the finished, bonded component. Cuts are inspected against all relevant quality features as well as position, location, and size and are rejected if necessary. Inspection following impregnation and bonding ensures the quality of the component parts.

CFRP/GFRP - 2D/3D Position Determination and Quality Inspection