

JAMES CROPPER

CASE STUDY



SURFACETEC™

UNDERSTANDING & IMPROVING SURFACE FINISH

Achieving a high-quality surface finish remains a key challenge in composite manufacturing. Surface defects such as print-through, pinholes, voids and resin inconsistencies often require extensive sanding, filling and finishing operations, which adds cost, time and variability to the production process.

To better understand the factors influencing composite surface quality, James Cropper undertook a programme of independent testing to evaluate the impact of surfacing veils on finished composite appearance. The study compared composite laminates manufactured with James Cropper's SURFACETEC veils against leading competitive veil solutions and laminates produced without a surfacing veil incorporated.

The results demonstrated a significant increase in surface quality, with the SURFACETEC laminates demonstrating a 70% improvement in composite surface roughness compared to competitor veil technologies and a 77% improvement compared with no veil.

The findings highlight the ability of SURFACETEC to create a more uniform resin-rich surface, minimise print-through, and reduce the need for secondary finishing operations, helping manufacturers achieve higher-quality parts while improving processing efficiency and reducing overall manufacturing costs.

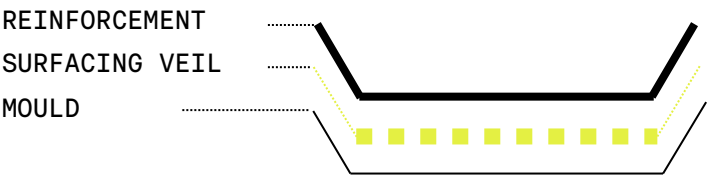
ACHIEVE A

77%

IMPROVEMENT IN COMPOSITE
SURFACE ROUGHNESS

INCORPORATING SURFACING VEILS

The veil is placed at the outer surface of the laminate, between the mould and the structural reinforcement. It can be applied next to a pre-preg or resin film layer or alternatively infused with resin during vacuum infusion, pultrusion or other composite manufacturing processes.



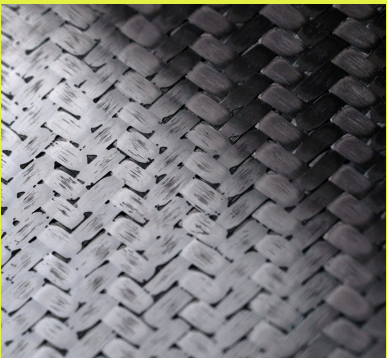
The veil’s porous, uniformly distributed fibre structure takes up resin evenly, creating a controlled resin-rich layer that masks underlying reinforcement patterning and improves surface consistency. The result is a smoother composite surface that requires less post-processing, reducing finishing time, labour and associated material costs.

Material type & grammage are selected to suit the component, resin system, moulding route and target finish.

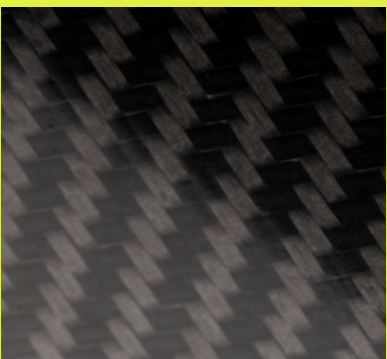
PRODUCT PORTFOLIO

VEIL FIBRE TYPE	AREAL WEIGHT RANGE
ARAMID	8 - 200 g/m ²
CARBON	2 - 200 g/m ²
E GLASS / FINE GLASS	6 - 300 g/m ²
POLYESTER / FINE POLYESTER	8 - 200 g/m ²
RECYCLED CARBON	10 - 200 g/m ²

A VISIBLE IMPROVEMENT



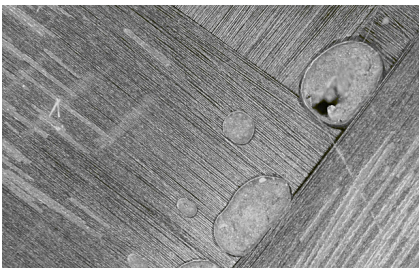
LAMINATE CONTROL SAMPLE - NO SURFACING VEIL



LAMINATE WITH SURFACETEC™ CARBON SURFACING VEIL

EVEN AT MICRO SCALE

Optical microscope images taken at x5 magnification:



LAMINATE CONTROL SAMPLE - NO SURFACING VEIL



LAMINATE WITH E GLASS SURFACING VEIL

BENEFITS

Using SURFACETEC™ significantly reduces:

- Print-through from woven or structural reinforcement
- Pinholes, voids and localised surface defects
- Inconsistent visible-carbon appearance
- Labour-intensive sanding, coating, painting and rework
- Added weight from heavier surfacing layers
- Variation in finish across production runs

SURFACE ROUGHNESS STUDY - RESULTS

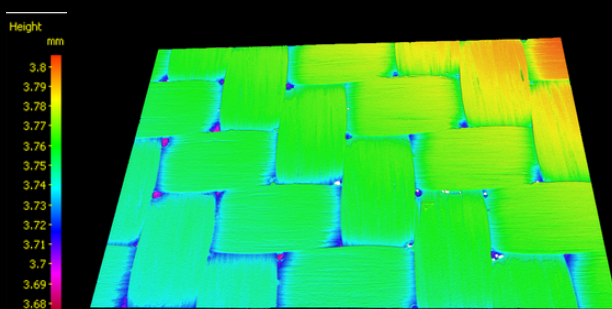
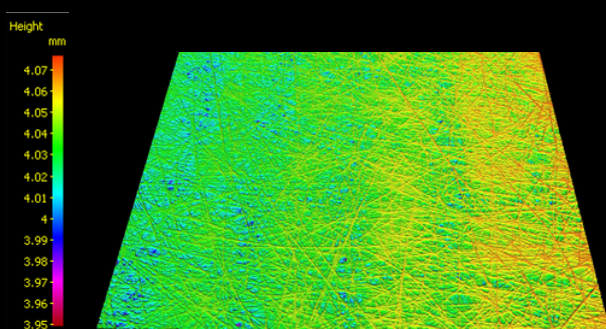
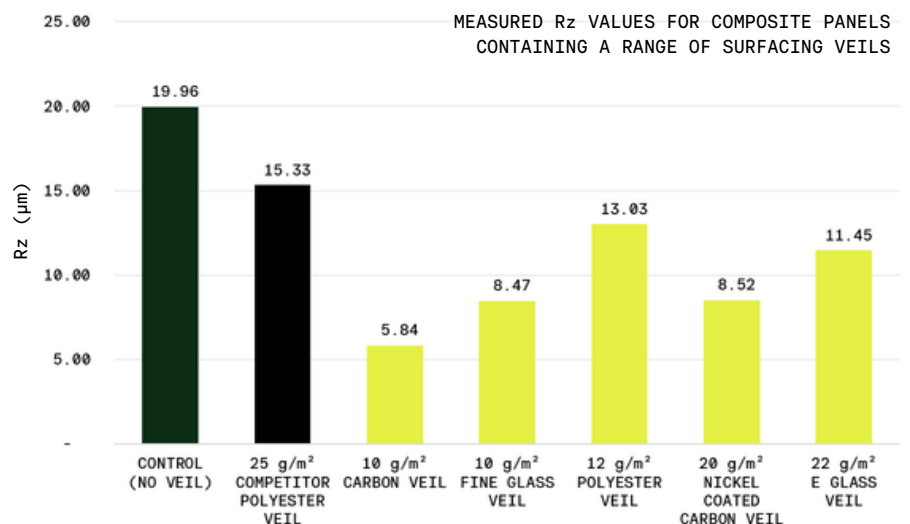
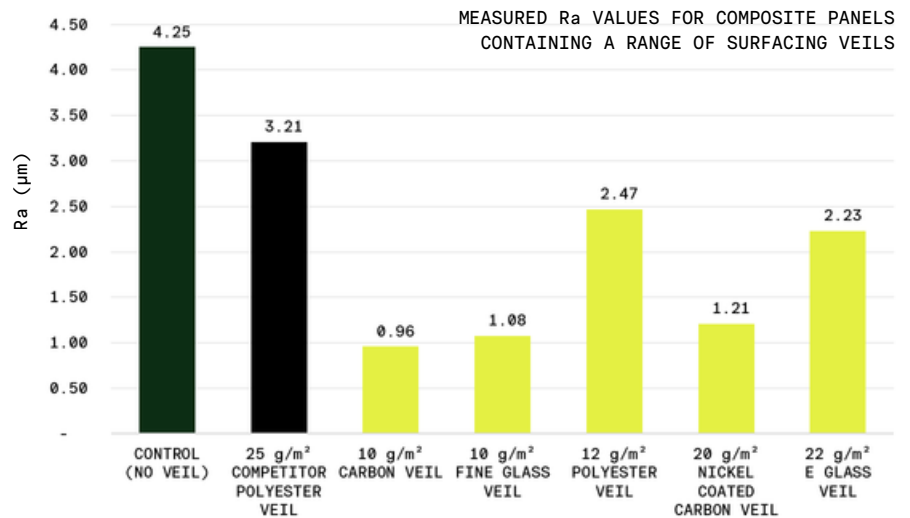
Sample panels were prepared, these consisted of 8 plies of 220 g/m² 2 x 2 twill weave prepreg (35-40% epoxy resin) and 1 layer of veil (if used) placed at the mould surface. Plaques containing a range of veil types (both James Cropper and competitor) were evaluated as well as a control panel which contained no surfacing veil.

The surface roughness of the panels prepared was evaluated by IMVS for both Ra (Arithmetic Average Roughness) and Rz (Average Maximum Height of the Profile) using the test method ISO 4287. All panels demonstrated a measured improvement in composite surface roughness relative to the control.

Using SURFACETEC achieved:

- An Ra value up to 77% lower than the no-veil control
- An Rz value up to 71% lower than no-veil control
- An improvement of up to 70% in Ra and 62% in Rz compared to competitor veils.

The best-performing laminate was the 10 g/m² carbon veil with an Ra of 0.96 µm & Rz of 5.84 µm.



3D SURFACE IMAGING

3D surface scans were also carried out using a Bruker Alicona optical measuring device. These images (left) show the surface of the control and best performing laminate (10 g/m² Carbon Veil).

The scan shows the reduced surface variation and larger defect reduction in the laminate containing the surfacing veil in comparison with the control.

COMPOSITE LAMINATE WITH 10 g/m² CARBON SURFACE VEIL

COMPOSITE LAMINATE WITH NO SURFACE VEIL (CONTROL)

TYPICAL APPLICATIONS

SURFACETEC provides a high quality, functional surface finish with minimal print-through and reduced finishing in a range of applications including:

- Sporting goods, including bicycle frames, skis, rackets, paddles and hockey sticks.
- Class A surfaces for automotive body panels and premium composite components.
- Interior and exterior aerocomposite components, including Advanced Air Mobility structures.
- Composite roll covers requiring controlled surface formation, wear resistance and electrostatic dissipation.
- Wind turbine blades, nacelles and composite tooling surfaces.
- Medical imaging tables and other composite medical components requiring a smooth, functional surface.
- Composite pipes, tubes and liners requiring a smooth internal surface with corrosion, abrasion or static-control performance.



KEY ADVANTAGES

CLEANER AESTHETICS

SURFACETEC minimises print-through, pinholes and visible surface defects, delivering a cleaner, more consistent appearance.

LESS POST-PROCESSING

A higher-quality as-moulded surface reduces the need for filling, sanding, coating, painting and rework, saving processing time and cost.

MINIMAL WEIGHT ADDITION

Lightweight veils, from 2 g/m², improve surface quality and can add functionality with minimal impact on component weight.

MORE EFFICIENT PRODUCTION

Uniform fibre distribution and controlled resin uptake support repeatable surface quality and efficient production.

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