The feasibility of the light-curing tapes was demonstrated in experiments in which tapes were made from fiber-glass fabric impregnated, variously, with (1) cationic epoxy resins plus a sensitizer that preferentially absorbs light at a wavelength of 380 nm, (2) free-radical curing acrylate resins, or (3) blends of resins of both types. Methods of incorporating adducts into the epoxies to tailor their viscosities were developed. The tapes were applied to aluminum and carbon/epoxy composite substrates that had been prepared by sanding and wiping with alcohol. The resins were cured by 380-nm light from LEDs. The blends of resins of both types were found to be advantageous in that during exposure to the light, their acrylate components contributed rapid buildup of strength, while their epoxy components contributed adhesion and longer-term strength.

The cathode layer can be deposited either before or after patterning of the anode. Optionally, to enhance the activity of the porous anode structure, a mixed-ionic-and-electronic-conductor film can be deposited on the anode patterning and etching. Typically, the total thickness of the anode/solid electrolyte/cathode sandwich of a TFSOFC is only about 15–25 micrometers. Operating at a temperature between 450 and 500 °C, a TFSOFC can utilize hydrogen or methane as a fuel. The power density of a TFSOFC can exceed 10 W/cm² (10 kW/liter), while the power per unit mass is ~3 W/g (or ~3 kW/kg). Relative to older thicker-electrolyte fuel-cell designs, TFSOFC designs can reduce costs of materials and reduce the volumes and masses of fuel cells capable of generating a given amount of electric power.

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