

VACUUM CURING/DEBULKING TABLES

Accelerating product research & design and composite part repair

Customer Spotlight: Specialized Bicycle Components, USA



Application

Specialized Bicycle Components (Morgan Hill, California) designs and manufactures innovative and customized bicycles, components, and apparel. Utilizing a series of individualized measurements, such as height, weight, flexibility, and riding style, along with a state-of-the-art R & D facility, Specialized Bike can evaluate a rider and recommend modifications to an existing bike or design a new customized bike. Whether a professional racer, weekend warrior, or a cycling enthusiast, a poorly-fit bike can lead to inefficient riding, muscle fatigue, or even injury.

Specialized Bike Components can ensure riders are quickly able get back on the road or gain every possible advantage to get across the line faster by having the ability to quickly manufacture engineered composite or replacement parts. In addition, product design requires the capability to bond and cure existing or new bike components together in new and innovative configurations.

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VACUUM CURING/DEBULKING TABLES (CONTINUED)

Solution

BriskHeat has process heating equipment to cure composite resins, prepreg cloth (fabric reinforced with a resin), and bond adhesives. The BriskHeat VT4000 Vacuum Curing/Debulking Table, utilized at Specialized Bicycle Components, is specifically designed to quickly provide heat and vacuum in one easy step for composite manufacture or repair. BriskHeat tables are equipped with PID temperature controllers to provide better accuracy during ramp and cool cycles. The PID controllers can store and run ramp/soak programs or single temperature cures, as required by the composite material.

The custom engineered composite parts, with their specialized tooling, are placed directly on the table surface. A venturi pump quickly creates a vacuum to apply compression to the top and sides of the parts, within a rubber vacuum bag. The PID controller triggers the heating cycle and within hours, the customized parts are completely cured and debulked. To ensure temperature uniformity during the cure/debulk, an (optional) data-logger can be used to monitor the temperatures on multiple surfaces. For enhanced accuracy and precision, the data logger can be outfitted with up to 16 additional thermocouples. During the cure process, the thermocouple values can be charted and graphed for future evaluation. The data can be down-loaded and archived.

Compared to conventional and time-consuming, bagging and autoclaving composite repair processing, BriskHeat Vacuum Curing /Debulking tables allow for Specialized Bike customers to be back on the road or track in comparatively little time. They have realized additional value by using the table to create fixtures and display pieces.

Vacuum Table Features

BriskHeat Vacuum/debulking tables are available in three standard sizes

- VT4000: 60 in x 66 in (1.5 m x 1.5 m); total 52 in x 56 in (1.3 m x 1.4 m) usable area
- VT8000: 60 in x 132 in (1.5 m x 3.4 m), total 52 in x 124 in (1.3 m x 3.1 m) usable area
- VT 10000: 72 in x 144 in (1.8 m x 3.7 m); total 66 in x 138 in (1.5 m x 3.5 m) usable area

Standard voltages options are 3-phase and range from 208-480 VAC. Each table is constructed on a rugged frame assembly with a stainless steel heating surface. A 2-stage vacuum pump, pressure gauge, dual mechanical actuators to lift and hold the lid, and a junction box are included in the frame assembly.

The stainless steel lid includes a reusable rubber vacuum bag capable of 800% elongation. The lid has safety interlocks which can be adjusted to limit the travel of the actuators. This allows for quicker loading and unloading of components or parts from the table. Once lowered, the vacuum bag is sealed to the base of the table. A single switch actuates the vacuum pump for the debulking process.

Tables feature single (VT4000) or two zone (VT8000 and VT10000) heating. To add additional heating capacity to the top surface of parts, a custom insulated heating blanket can be added to double the number of zones. Each zone is equipped with a separate PID temperature controller (programmable to either °F or °C) capable of storing four different ramp/soak programs, each with up to 12 steps. Curing temperatures can be programed up to 400°F (204°C).

Types of Users

- Research and Development Engineers
- Composite Repair Technicians
- Design Engineers
- Maintenance Managers
- Manufacturers
- Operation Managers

Industries

- Airlines
- Composite Repair Facilities
- Composite Manufacturing Facilities