REPAIRCLAVE

An ISO 9001:2000 Certified Company

HCS3100 SERIES

RepairClave

HEATCON®
COMPOSITE SYSTEMS
COMPOSITE REPAIR SOLUTIONS

Training • Equipment • Accessories • Materials

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HEATCON® Composite Systems' expertise, with over 25 years in the composite repair industry, allows us to provide the most comprehensive and innovative equipment solutions on the market today, including our patented HCS3100 series RepairClaves. Your particular requirements will dictate how our RepairClaves will be designed, implemented, and delivered to your facility. The RepairClave is an American Society of Mechanical Engineering (ASME) certified pressure vessel.

Model HCS3100-48-3 Used for R&D in Schools and OEM's

The HCS3100 (Series) RepairClave is a semi-portable pressure vessel designed to provide controlled temperature, vacuum, and pressure during composite and metal bond repair processes. The positive internal pressure applied to the repair enables operators to achieve the higher pressure when required by aircraft manufacturer repair manuals. Heat is applied only where required using specially constructed silicone rubber heat blankets. This method results in reduced operational costs and fewer problems due to temperature induced part damage.

One application which has been an instant success is the repair of helicopter blades using the RepairClave. The repair procedure on certain blades calls for pressure in excess of that which can be achieved using vacuum. The traditional method of using pressure 'bladders' is far from being perfect, and requires additional tooling. Helicopter operators and major manufacturers have been quick to see the advantages of such a system.

The HCS3100 series RepairClave also features a control system based on our "World Renowned" HCS9200B Hot Bonders. If you already own one of our composite repair systems, then you already have the basic skills and knowledge necessary to operate the RepairClave. This commonality approach to our control system configurations allows increased efficiency within your repair shop.

The RepairClave is also designed to repair flight control surfaces such as: Inboard flaps, Ailerons, Winglets, Elevators and Rudders. The RepairClave also allows the individual MRO's to maintain control of the part being repaired, instead of sending the part to a 3rd party repair facility with an autoclave.

ADVANCED POSITIVE PRESSURE COMPOSITE REPAIR SYSTEM

Control System based on our "World Renowned" Hot Bonders

SPECIFICATIONS

Dimensions:
- Standard Lengths Available: 3ft - 35ft (.9m - 10.6m)
- Inside Diameter: 3ft - 6ft (.9m - 1.82m)

(Length and Diameter are Customizable upon Request)

Power Requirements:
- Minimum - 240V, Single Phase - 60 Amps
- Maximum - 480V, 3 Phase - Amperage Depends on customer configuration requirements

(Various Voltage, Multiple Zones, and Phase Configurations Available)

Operating Pressure:
- Max Operating Pressure: 75 psi
- Design: the ASME Certified Vessel is designed to operate from 0 - 75 psi
- Certified Pressure Relief Valve built in, per ASME, for your safety

Construction:
- Vessel: Constructed from certified rolled plate steel material (SA516-70). ID Label Stamped with Final ASME Hydrostatic Test Documentation and Data Plate
- Closures: Hinged Closure - Locking Mechanical Devices per Design
- Fixed (Closed) End - Welded Domed Tank Head
- Locking Casters and Floor Jacks for Mobility and Stablization
- Additional Auxiliary Ports for Future Expansion

Calibration:
- 1 Year Intervals recommended by HEATCON® Composite Systems

Re-Certification:
- No Annual Certification of the Pressure Vessel required

(Please check local government directives which may supercede this requirement)

HCS3100 RepairClave as installed for Helicopter Blade Repair

ADVANTAGES	
RepairClave	**Autoclave**
Lower Power Requirements	Requires High Voltage Substation
No N_2 Purge	N_2 or CO_2 Purge Required
No Foundation Modifications	Major Foundation Modifications Required
Easily Transportable	Expensive Transportation Logistics
Uses Local “Plant” Air	Requires High Volume Compressor

The RepairClave concept is a relatively simple one when compared to the complexity of an Autoclave. It has significantly fewer components and therefore a much reduced weight. This means that the unit can be shipped as a complete assembly, which simplifies transportation to site. More importantly, this allows hydrostatic testing to check the integrity of welding and confirm compliance with the ASME (or local-specific) code to be performed before shipment.

Unlike with a permanent Autoclave installation, there is rarely any need to provide special civil foundations. Lockable casters and leveling jacks are usually fitted which makes repositioning within a facility relatively easy.

With the exception of the pressure vessel and vacuum bag venting, the RepairClave is very similar to a Hot Bonding operation. As such, there is no need for a complex computer-based control system, as used on an Autoclave.

The temperature control is provided by an integral Hot Bonder System, programmed in the same user-friendly way as our standard HCS9200 Dual Zone unit. This has the advantage that any technician who has used the Hot Bonder will already have a basic understanding of RepairClave operation.

By utilizing a dual, or two-zone controller, it is possible to perform two independent repairs at the same time, or to ‘slave’ the two zones in order to complete a larger repair, using either two single-zone blankets, or one, two-zone heater.

We use our industry leading heat blanket technology to produce both standard and custom formed heat blankets capable of withstanding the temperatures and pressures required for these repairs.

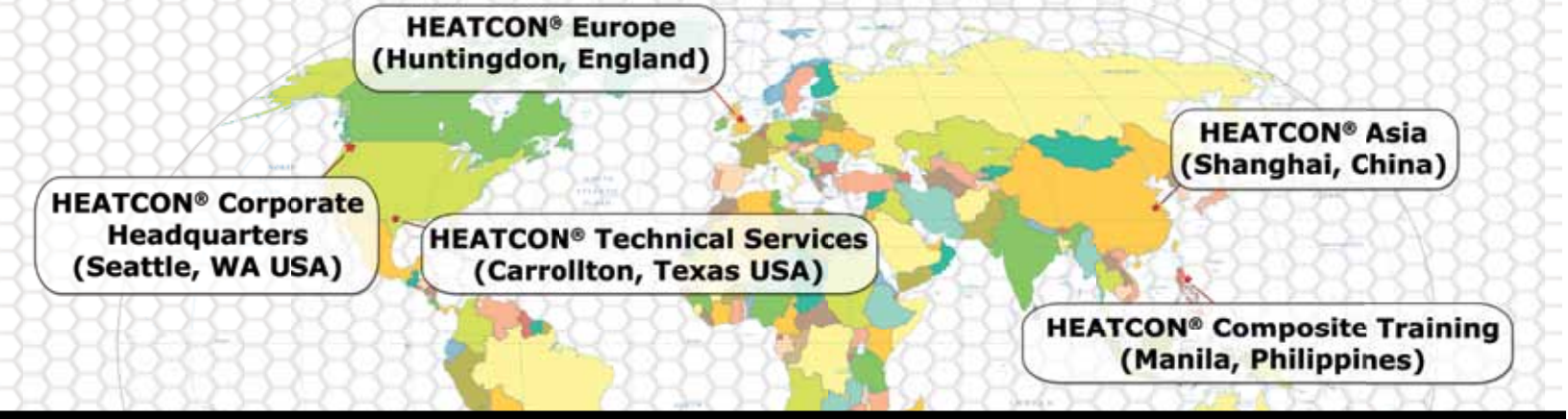
The biggest advantage of using heater blankets to provide localized heat is that the total volume inside the pressure vessel does not need to be heated to the cure temperature. Therefore, the operational costs, as compared to that of a gas, electric, oil, or steam operated Autoclave are minimal. Another cost saving is realized through the employment of compressed air as the pressure media. The use of heater blankets allows the internal air temperature to be kept well below that of the cure.

The same heater blankets, when not used in the RepairClave, can be utilized for a standard Hot Bonding procedure, which maximizes their usefulness.

The RepairClave is a viable alternative to an autoclave, with substantial cost savings in procurement and operation, in most repair and some manufacturing scenerios. Therefore those large, previously ‘out of capability’ repairs may in the future become common practice for most repair facilities.

HEATCON® *Family of Companies*

World Wide Service and Support



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