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The Omega OMT-1.0 Hot Bonder KIT for composite repair and non-destructive testing (NDT) of aircraft, helicopter and UAV units

Omega Engineering LLC
2026

The Omega OMT-1.0 Hot Bonder KIT

- The Omega OMT-1.0 Hot Bonder KIT is the world's most complete, all-in-one equipment to debulk and cure resins, prepregs, adhesives, fibers, and more.
- This equipment controls the temperature and vacuum for on-the-spot composite and metal bond repairs/cures.
- These system are portable and self-contained.
- Includes Everything You Need: Input and Heater Power Cords, Vacuum Hose, Vacuum Bag Feed-Throughs, Thermocouples, Silicone Heating Blankets.

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About problem

- Composite materials and honeycomb structures of aircraft, helicopter and UAV are more sensitive to concentrated loads and are often damaged by different objects.
- The variety of manufacturing processes used in the production of structures results in differences in the mechanical properties of materials and the potential for defects to form on the structure's surface. Moisture is absorbed into cracks, leading to their development and a reduction in the structure's strength.

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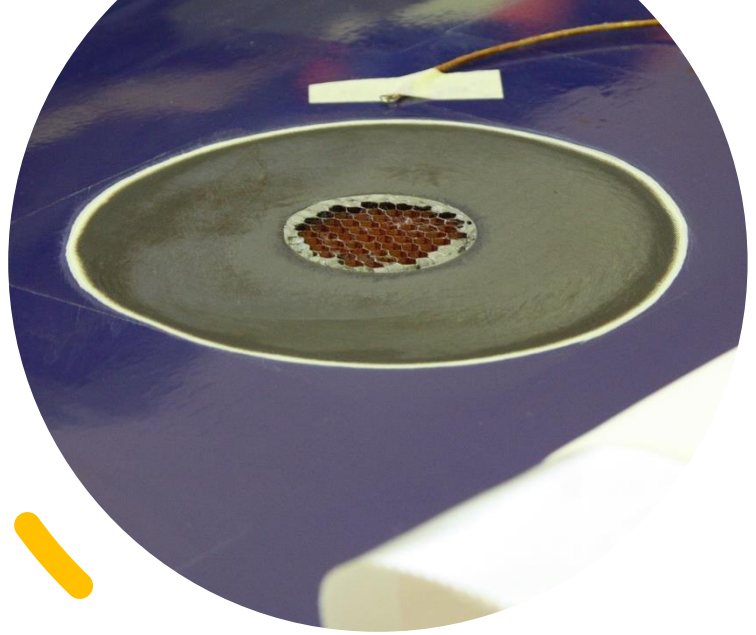
Solution by Omega

- The original strength and dynamic characteristics of aircraft, helicopter and UAV structure may be achieved by using the technology of mounting a repair patch prepare from similar materials, using prepregs and adhesives, while ensuring the necessary temperature and vacuum for molding and gluing the repair patch.

Solution by Omega

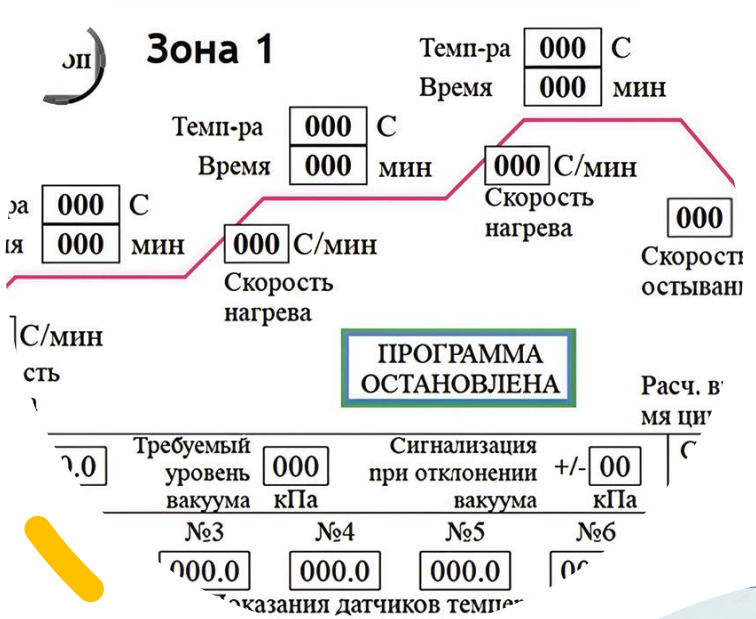
Omega OMT-1.0 Hot Bonder KIT provides all the necessary conditions for repairing honeycomb and monolithic aircraft, helicopter and UAV structures by a repair patch using hot bonding.

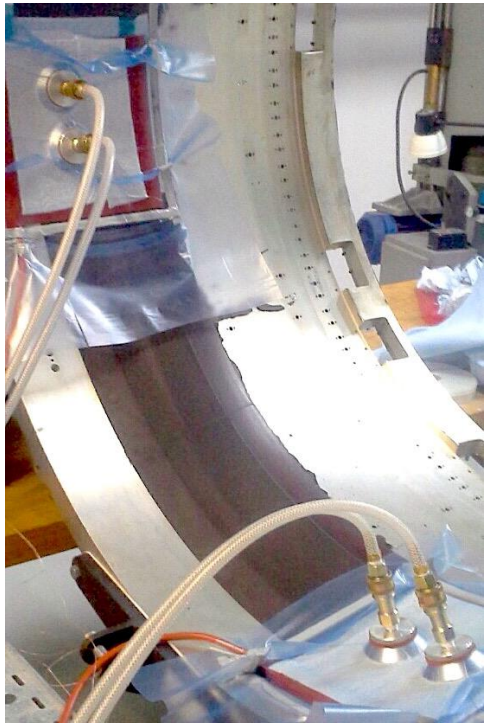
- Maintains the required temperature for a specified period of time (up to 260ºC) to fasten the curing of the adhesive.
- Provides the necessary vacuum to maintain the required pressure for molding the repair patch.
- On-line monitoring the repair process by touch screen with easy-to-use interface.
- Digital data logger: prints and records real-time status of cure including program parameters.



The best features of the device

- The ability to repair aircraft, helicopters, and UAVs directly in the field, ensuring strength characteristics similar to those achieved in aircraft repair shops.
- Repair of not disassembly construction.
- Without of disassembly, assembly, and transportation costs.
- Dual zone repair of structures.
- On-line monitoring of the repair process.
- Small repair staff.





The Omega OMT-1.0 Hot Bonder KIT may be used for repair of abrasive coatings on fan housings and sound-absorbing panels of aircraft engines.

Application for aircraft engine repair

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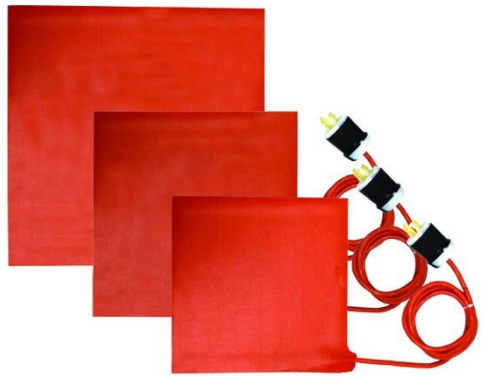

Composite Heat Curing Blankets

The Omega PNT-1 Hot Bonder KIT complete flexible, high-strength silicone heat curing blankets of various shapes and sizes, standard types and non-standard types, designed and manufactured according to the customer's technical specifications.

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Special Composite Heat Curing Blankets

- Special Composite Heat Curing Blankets with built-in vacuum feed-throughs for composite repairs without the use of vacuum bag, because the heater is the bag.
- Composite Heat Curing Blankets with built-in vacuum feed-throughs can be designed and manufactured in any complex shape, according the customer's specifications.

Radome heaters

- Convenient Built-In Vacuum Seal
- Very Uniform Heating
- Perfect Fit to Radome

Experience

- Omega Engineering, in collaboration with aircraft manufactories and avia companies (MIG, Sukhoi, Tupolev, Yakovlev, UZGA, Aeroflot, S7, Air Astana etc.), has big experience used Hot Bonders in the Russian and CIS aviation industry.
- Many production tests of the equipment in aircraft component repair has positive test results with high composite repair quality and economic benefits. Aircraft R&D departments included the equipment in the technical repair documentation for repairing damaged structural sections (dents, holes, cracks, etc.).
- Based on OMT-1.0 Hot Bonder, a comprehensive NDT and moisture removal method was developed in collaboration with Tupolev engineers.

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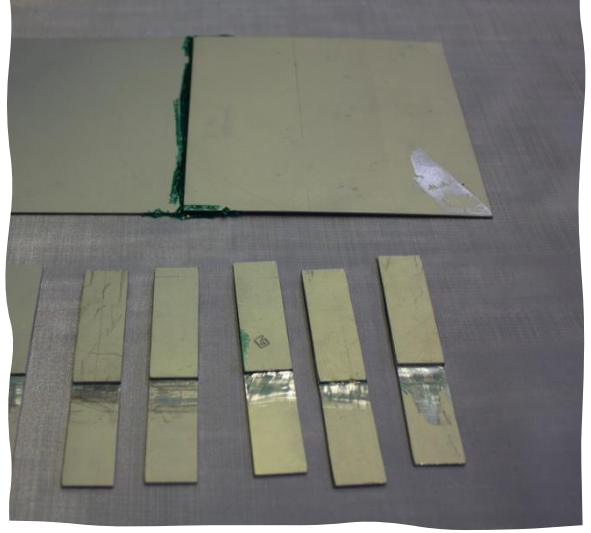
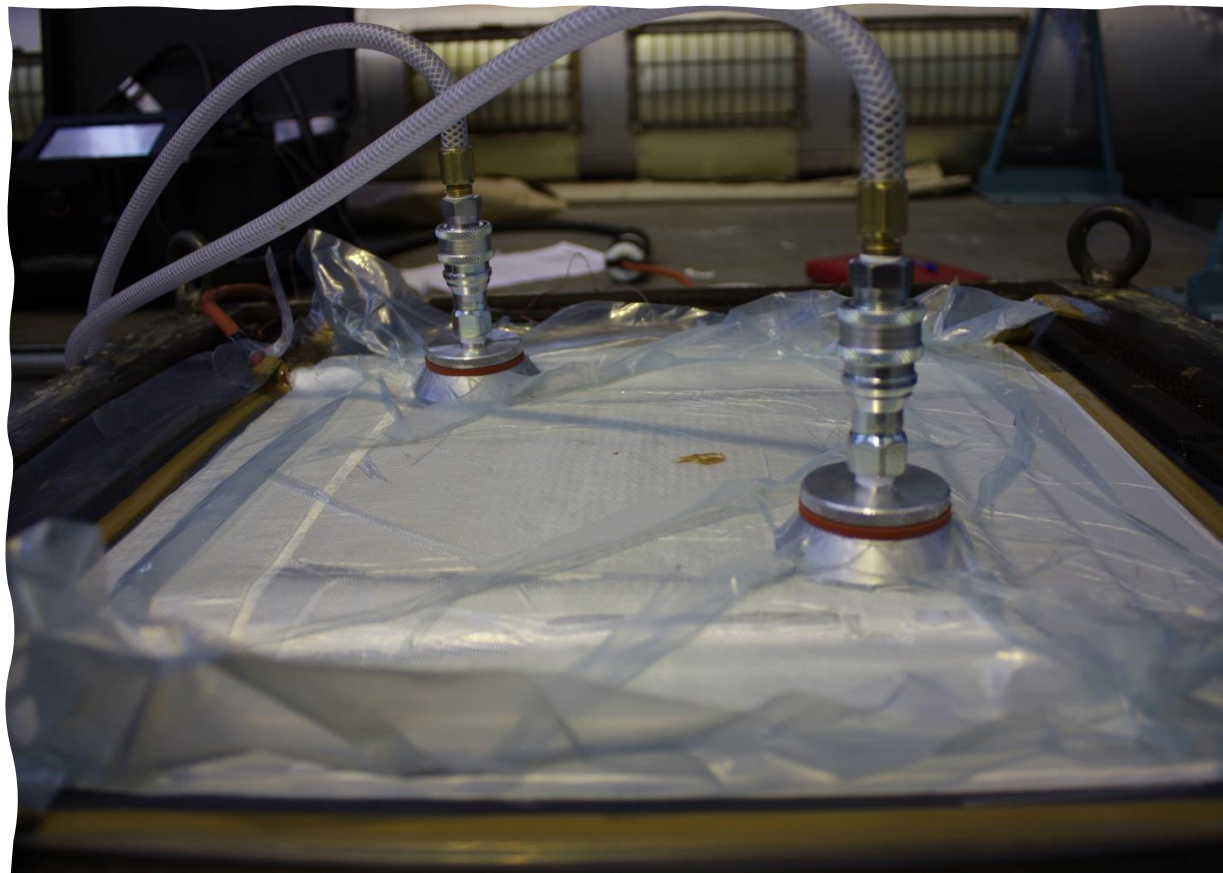
Strength Test in the Tupolev

Strength Test for improve the quality and speed of repairs of honeycomb structures of composite parts and metal structures.

- Reference specimens simulating repairs based on shear strength.
- Reference specimens simulating repairs based on peel strength of the adhesive bond between the honeycomb core and the skin.





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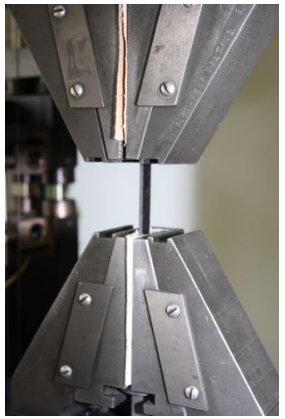
Strength Test Result

Parameter	Unit of measurement	Standard	Nominal	Test data
Shear strength at 20°C (aluminum samples)	kgf/cm2	GOST14759-69	No less 200	217 229 224 234 235 Average 228
Ultimate strength at peeling of the skin (polymer composite samples)	kgf/cm2	OTS1.90069-72	No less 22	31,50 32,20 33,27 36,10 33,97 Average 33,41

Conclusion: The strength of the test samples simulating repairs using adhesives complies with regulatory documents.

Physical and mechanical parameters of repair specimens prepare by Hot Bonder.



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Reference

Omega Engineering has supplied equipment and provides technical support for Hot Bonders to many companies in the aviation industry

UAC UNITED AIRCRAFT CORPORATION

United engine corporation

UWC

TUPOLEV

SATURN

SUKHOI

UAC YAKOVLEV

МИГ

Tulpar Aero Group

UAC IRKUT

AEROFLOT

JETPORT TECHNICS

Aurora

S7 Airlines

air astana

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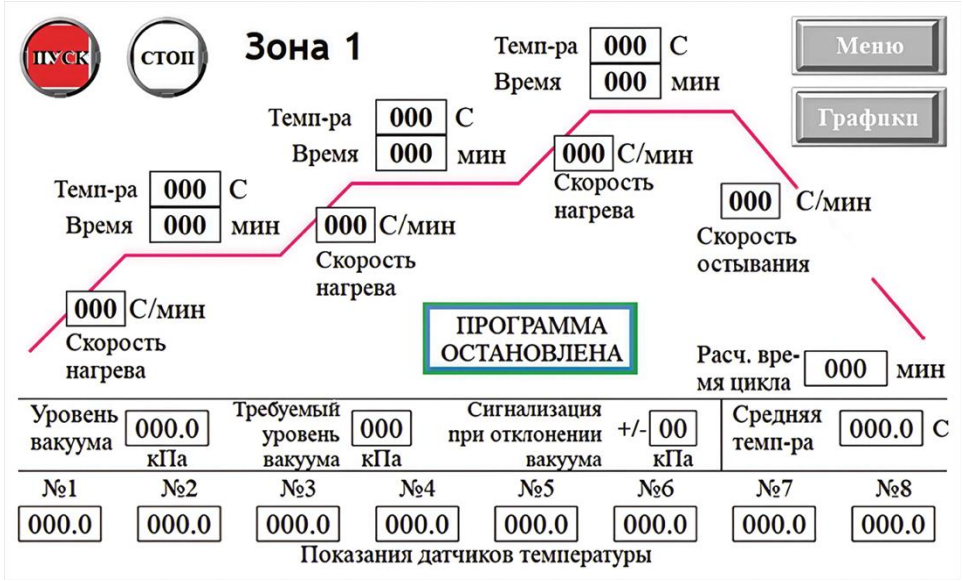
Specification

- Device Type:
  - Omega OMT-1.0-1-VE – single zone;
  - Omega OMT-1.0-2-VE – dual zone.
- Power Supply: 230V/50-60Hz, max 30A.
- Case/Dimensions:
  - OMT-1.0 Hot Bonder – Peli Case, 561x455x265 mm;
  - KIT Case – Peli Case, 499x393x191 mm.
- Waterproof – Peli Case made of HPX® polymer.
- Transportation – two wheels and retractable handle.
- Environment
  - Intended for use in dry environments.
  - Storage temperature range: -20°C to 60°C.
  - Operating temperature range: 5°C to 40°C.
  - Maximum relative humidity: 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Specification

- Heating Temperature Controller:
  - Full-color touchscreen display with an easy-to-use interface;
  - Controls ramp rate, soak, and cooling;
  - Displays the current running program profile: Fixed, Single, Dual, Triple or Monitor;
  - Select the temperature measurement source. The source can be Average, Lowest, Highest or any specific thermocouple;
  - Max. heating temperature up to 260ºC (accuracy ±1.7ºC);
  - Connects up to 8 K-type thermocouples for each work zone;
  - USB port for data transfer;
  - Transfer and archive post cure data history to your PC;
  - Analyze your data instantly and effortlessly on your spreadsheet and word processor programs including: Excel® and Word®.



Specification

- Vacuum
  - Dual Vacuum System: Built-in Electric Pump and Vacuum Venturi;
  - Vacuum pressure: -0,097 MPaG.
  - Flow:
    - 5.7 scfm (Vacuum Venturi);
    - 0.9 scfm (Electric Vacuum Pump).
  - Ability to manually adjust pressure for each zone.

Package Contents

- ❑ OMT-1.0 Hot Bonder unit single/dual zone.
- ❑ An accessory storage case containing:
  - One 3 m input power cord with bare wire per zone;
  - One 1,5 m heater output power cord per zone;
  - 8 K-type thermocouples with mini connectors per zone;
  - 8 Standard connector adapters for thermocouple receptacles per zone;
  - Two 3m vacuum hoses per zone;
  - Two vacuum bag feed-throughs per zone;
  - USB flash disk;
  - Composite Heat Curing Blankets Kit for one zone:
    - CHB-500/230-255X255 (500W/230V, 255x255 mm);
    - CHB-700/230-310X310 (700W/230V, 310x310 mm);
    - CHB-1300/230-410X410 (1300W/230V, 410x410 mm).

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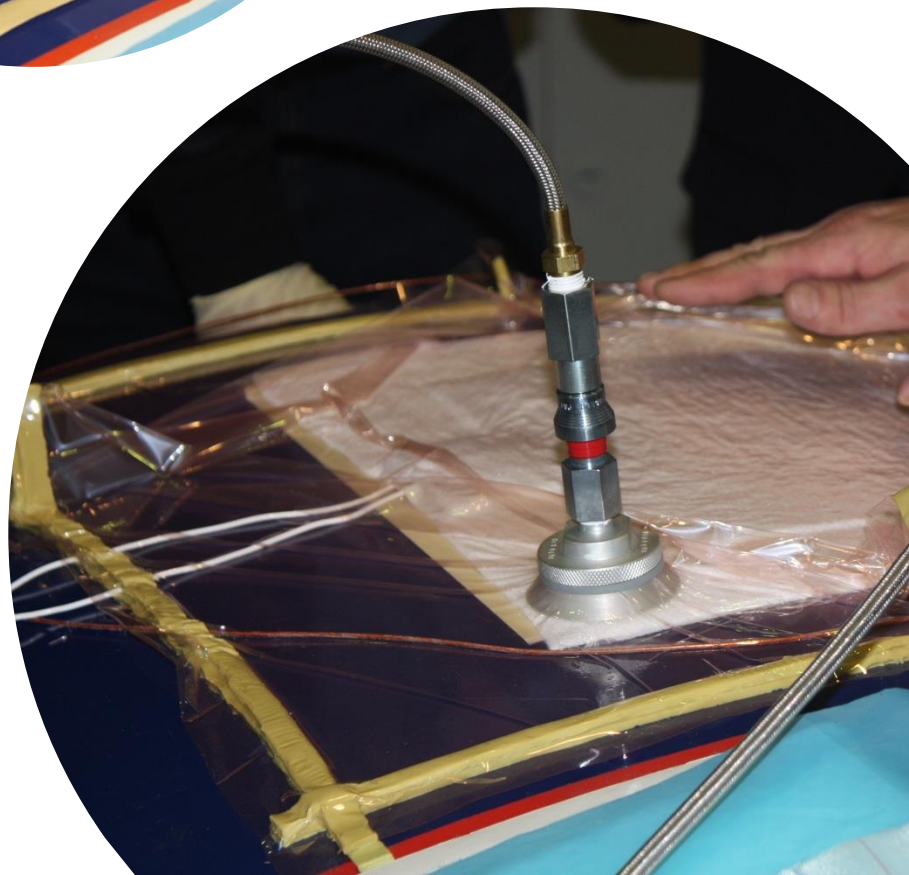
Composite Repair Training

- Omega Engineering offers certified training courses for the repair of composite parts.
- The purpose of this training is to assist specialists in the repair of composite aircraft structures.
- This training is designed to prepare and certify specialists in the repair and fabrication of composite aircraft structures using the Omega OMT-1.0 Hot Bonder KIT.
- The training includes theoretical and practical lessons.



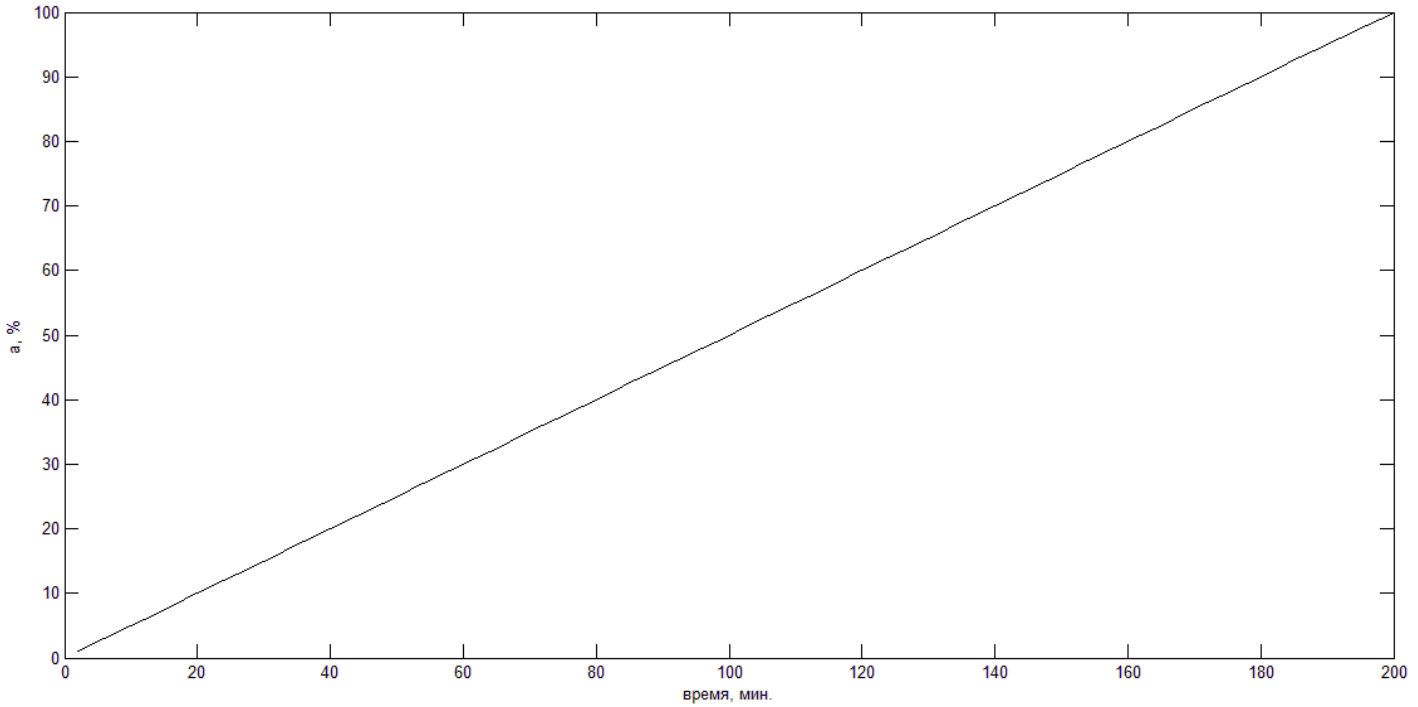
NDT and removal moisture by Omega OMT-1.0 Hot Bonder KIT

- NDT and removal of moisture in aircraft composite structures by active thermal non-destructive testing (NDT) using a technology that can be in field and aircraft repair shop.
- Composite repair of damaged of aircraft, helicopter, UAV structures (dents, holes, cracks, etc.).

STEP 1

NDT of moisture in the tested aircraft structure

- A method for NDT and removing moisture with a formula for determining the estimated amount of moisture in a structure.
- This method allows for the next step in determining the evaporation time.



Calibration graph
"Required liquid evaporation time versus moisture content"

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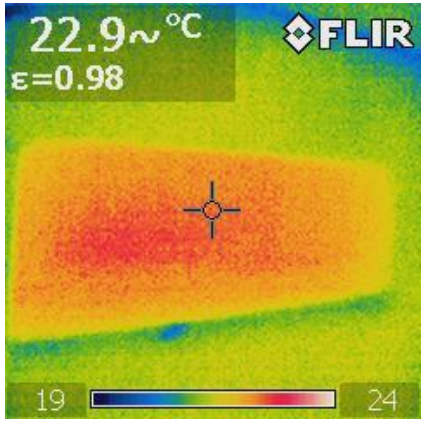
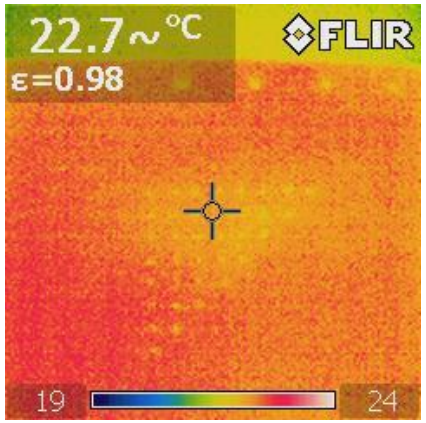
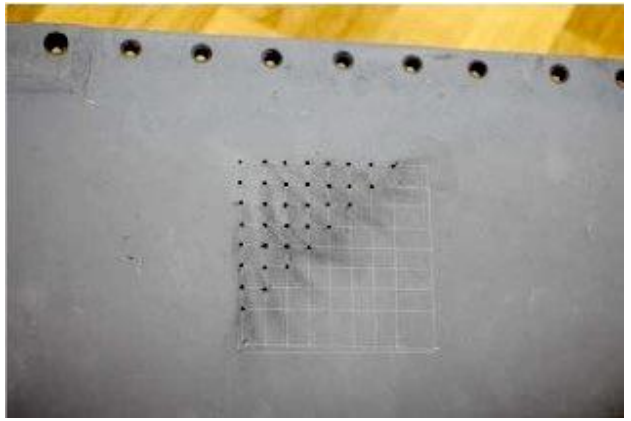
OMT-1.0 Hot Bonder KIT +
Thermal Camera

Thermal imaging of the tested honeycomb structure



Thermal imaging of the tested honeycomb structure
with holes for artificial flooding





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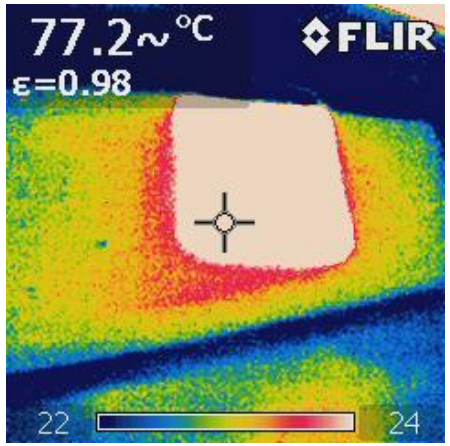
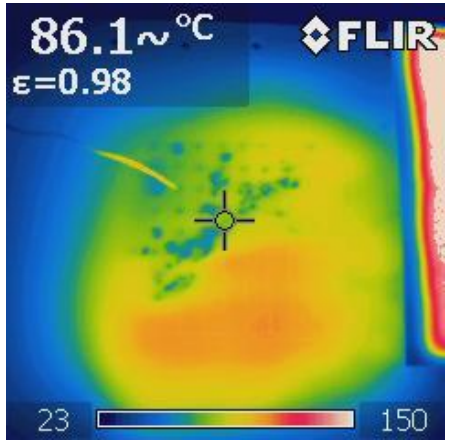
NDT program schedule

Thermal imaging of the tested honeycomb structure, while identifying waterlogging zones (moisture presence)



Thermal imaging of the tested honeycomb structure, after heating, showing a waterlogged zone



STEP 2
Remove of moisture

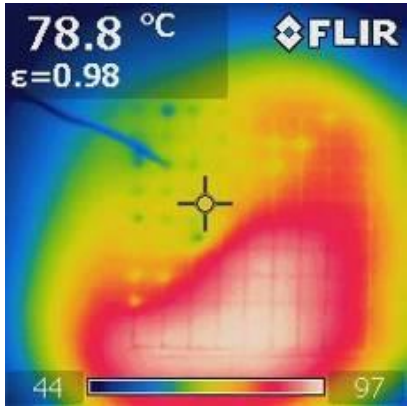
- Preparing the tested honeycomb structure before removing moisture.
- Remove moisture from the honeycomb structure.

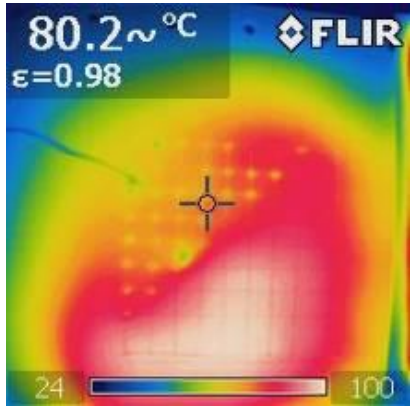
Remove moisture program schedule

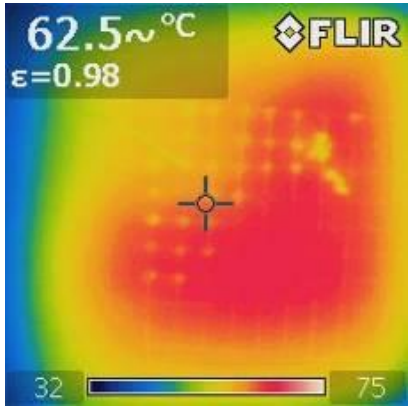
Mounting the heater on the testing composite panel and prepare the vacuum bag

The test result for NDT and removal moisture by Omega OMT-1.0 Hot Bonder KIT showed that the moisture content was less than 0,5%.

Thermal imaging of the tested honeycomb structure, after moisture removal







Omega Remote Cloud Bonding

- The Omega Remote Cloud Bonding gives you the possibility to supervise several OMT-1.0 Hot Bonders at once remotely on different devices, via a private and secure cloud server.
- It offers total freedom in managing hot bonders and curing cycles.
- Easy maintenance and repair.

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Solution

- Improving the efficiency of aircraft operation
- Reducing downtime due to malfunctions.
- Reducing the time and costs of repairs and spare parts.
- Accurate planning and timely execution of maintenance and repair.
- Reducing accidents and ensuring flight safety.
- Improving the efficiency of repair planning and organization.
- Automation of aircraft condition recording and maintenance and repair work performed.
- Accounting and planning for the use of consumables and vacuum materials.

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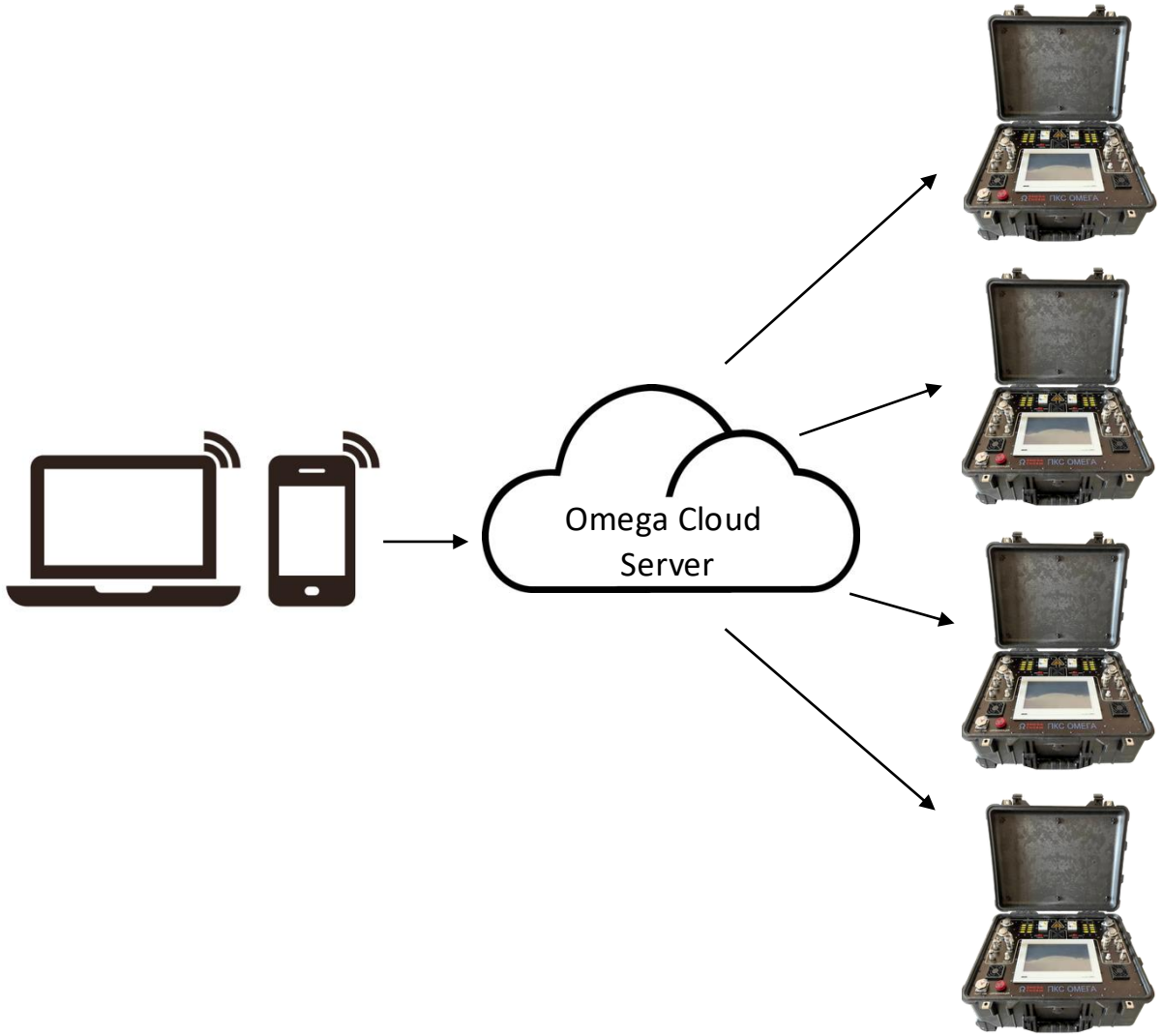
Solution

- Creation of a database of completed repairs to ensure monitoring of the technical condition of repaired components and analysis of the recurrence of damage and defects.
- Local and global networks OMT-1.0 Hot Bonder.



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